

Approval and Communication of Refinery, Maintenance, or Engineering Instructions

Document No.: RI-9900	Title: Control of Hazardous Energy	Current Date: 2/2010
Action: <input type="checkbox"/> New <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Cancellation		Next Revision Due: 2/2013
Responsible Organization: HES		Position to Contact With Questions/Suggestions: Safety Team Lead
Summarize Rewritten Material: Click on the next page to see "RI-9900 Changes" document.		

REQUIRED COMMUNICATION/TRAINING

If Type 2 or Type 3 training is necessary – Instruction Owner is responsible for developing the training material and must work with Development Department Manager and Managers of affected personnel to coordinate training of affected personnel and documentation of training.

This document should be reviewed by:	Type 1 Simple Change	Type 2 On-The-Job Training	Type 3 Classroom Training
All Refinery Personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operations	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Maintenance & Reliability	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Technical	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Capital and Large Projects	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

APPROVALS

Instruction Owner: Tom DiPalma	Development Manager: <i>(first signature before final routing)</i> Dean Van Bockern
Operations Manager: Bruce Chinn	Technical/Reliability Manager:
HES Manager: Tery Lizarraga	Maintenance & Reliability Manager: Jay Peterson
Refinery Manager: <i>(final signature)</i> Mike Coyle	Other Manager:

On Completion – Instruction Owner will send file and message to IPC to post on the Refinery server.

Necessary Approval for Instructions:

- | | |
|---|---|
| <ul style="list-style-type: none"> • Refinery Instructions: • Safe Work Practices: • Emergency Plans (400 Series RIs): • Engineering Instructions: • Maintenance Instructions: • Cancellation of Instruction: | <ul style="list-style-type: none"> Development, Operations, HES, and Refinery Manager Development, Operations, Maintenance & Reliability, HES, and Refinery Manager Development, Operations, Maintenance & Reliability, HES, and Refinery Manager Technical and HES Manager Maintenance & Reliability and HES Manager RI Owner and Refinery or Operations Manager |
|---|---|

RI-9900 Changes

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Global Downstream

Insert SBU/BU Name

Safe Work Practice Standard

Insert Standard Name

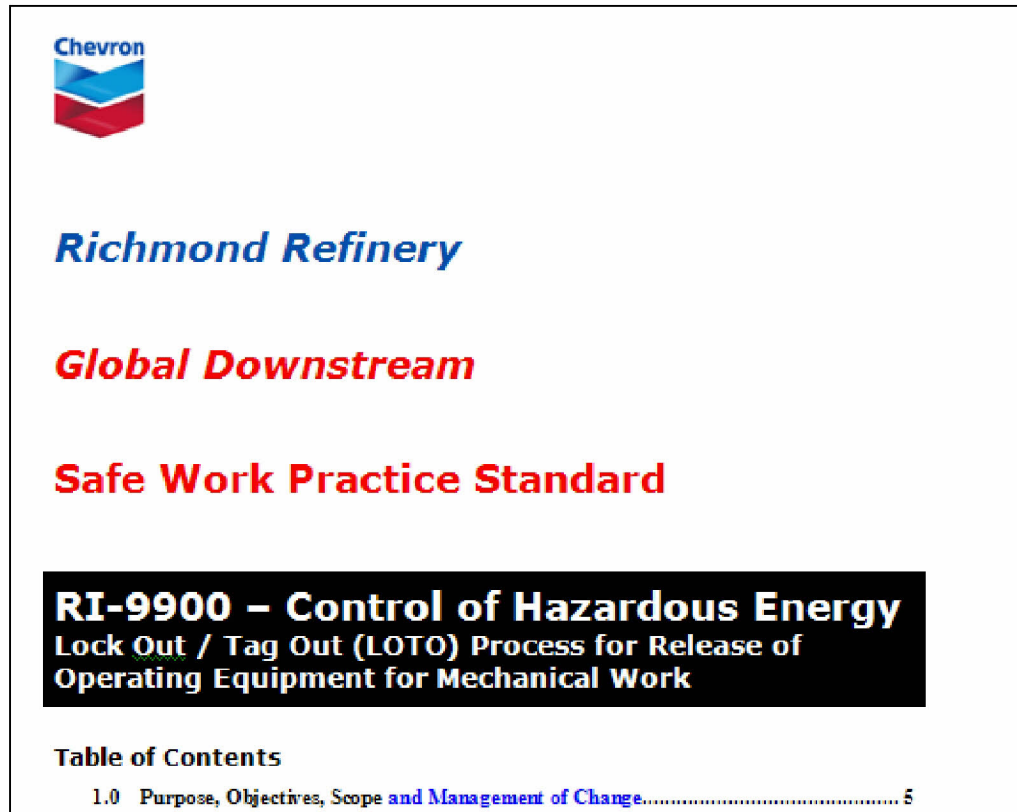
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RI-9900 Changes

The Look

- Format
- Template – Global Safe Work Practice (SWP)
- Design



The Global Safe Work Practice (SWP) template has eight sections. The information in RI-9900 has been re-organized to reflect the new sections. The sections are:

- 1.0 Purpose, Objectives, and Scope
- 2.0 Terms and Definitions
- 3.0 Roles, Responsibilities and Training Requirements
- 4.0 Standard Instructions
- 5.0 Records
- 6.0 References
- 7.0 Other Guidance Documents
- 8.0 Revision History

RI-9900 Changes

Where is RI-9900 information located in the SWP Format?

Table 1 shows the relationship between the SWP format and RI-9900. Some sections in RI-9900 are not included in the SWP format. Those sections are listed in Table 2.

Table 1 – Cross Reference between SWP and Refinery Instruction

SWP		Refinery Instruction	
1.0	Purpose, Objectives, and Scope	1	Purpose and Philosophy
2.0	Terms and Definitions	Appendix 1 – Definitions	
3.0	Roles, Responsibilities and Training Requirements	4.0	Management Responsibilities
		5.0	Operations Responsibilities
		6.0	Electrician Responsibilities Mechanical
		7.0	Craft Personnel Responsibilities
4.0	Standard Instructions	8.0	Isolation Methods
		9.0	Field Verification of Isolation
5.0	Records	12	Auditing
6.0	References	Appendices Forms	
7.0	Other Guidance Documents	Other Refinery Instructions referenced in this RI.	
8.0	Revision History	Used in addition to: MFG 1641-2 – Approval and Communication of Refinery Instructions, Maintenance, or Engineering Instructions.	

Table 2 – RI 9900 Sections not included in SWP format.

Not included in SWP		Refinery Instruction
2.0	Variances	RI reads: “Exceptions to RI-9900 procedures may only proceed after completing the Management of Change requirements as found in RI-370.” Team believes the RI is clear. If an item is not listed in the RI then the next logical step is to start MOC.
10.0	Transportation of Equipment	RI reads: “Equipment being transported elsewhere for repairs or servicing must be cleaned and tagged with an Equipment Shipping Tag, MFG-7254. Refer to RI-304 “Preparation of Equipment for Transportation” for instructions on identifying and transporting equipment.” Team believes this is not part of Lock Out/ Tag Out.
11.0	Upon Completion of Mechanical Work	RI reads: “11.1 Operations and Maintenance personnel shall inspect the job. Operations will then approve preparations for returning the equipment to service, including removal of locks and tags from lockbox.” Team believes this is not part of RI-9900. Follow PSSR.
		RI reads: “11.2 The responsible Operator will sign the Mechanic’s copy of the work order, signifying that the work has been completed and that the work site has been satisfactorily cleaned up.” Team believes this is not part of RI-9900. Follow PSSR.

RI-9900 Changes

Not included in SWP		Refinery Instruction
13.0	Turnarounds	RI reads: "Major turnarounds involve working in a plant with conditions often different than routine plant operation. Normally, the plant is isolated from other Refinery operations with plot limit or other major system blinds and the plant or system has been depressured and cleaned. These conditions may warrant isolation procedures that deviate from those listed in this Instruction. See Appendix E for approved Turnaround Isolation Procedures." Team believes this can be placed in Appendix V (now Appendix E - Turnaround Isolation Procedures).
14.0	Contractors	"Contract employees will use this Refinery Instruction for work involving lockout/tagout while working in the Richmond Refinery. An exception to this requirement may be granted with written approval of the Manager of Maintenance or the Refinery Safety Team Lead. Project work involving "green field" locations where the project is not connected with existing Refinery processes or plant activities is an example of when an exception may be granted. Review RI-366 for further detail regarding contractors." Team believes this can be placed in RI-366. Refer to 3.1.2 of this SWP where it addresses contract companies.
Figure 1	LockOut/TagOut Flowchart	Removed.

Table - 3 lists Appendices in RI-9900 and its location.

Table 3 – Appendices Index for RI

Used to be		What it's called now	
Appendix 1	Definitions	Section 2.0	Definitions
		Appendix A	Routine Maintenance Isolation/Blind List
Appendix 2	Electrical Isolations - Specific	Appendix B	Job Hazard Analysis/Joint Job Site Visit Form
Appendix 3	Special Isolation Procedures	Appendix C	Special Isolation Instructions
Appendix 4	Special Procedures Involving Electrical Switch Cards	Appendix D	Electrical Isolation- Specifics
Appendix 5 Appendix 6 Appendix 10	Turnarounds Isolation List Job Hazard Analysis form (Shutdown Only).	Appendix E	Turnarounds
Appendix 7	Locks and Tags	Appendix F	Deviation Request Form
Appendix 8	Job Hazard Analysis Form	Appendix G	Tags and Locks
Appendix 9	RI-9900 Audit form	Appendix H	RI-9900 - Audit Form
Appendix 11	Deviation Request Form	Appendix I	Special Procedures Involving Electrical Switch Cards
Appendix 12	Working On Live Relief Systems	Appendix J	Working on Live Relief Systems

RI-9900 Changes

References

References are Section 6 of the SWP format. Table 4 lists document titles that are listed in this section. You will recognize these titles as the appendices of RI-9900. These specific appendices are forms used as part of Lock out / Tag out. There is a link to the form.

Table 4 – Reference forms used in RI-9900

Title	File Name
Routine Maintenance Isolation/Blind List	Appendix A
Job Hazard Analysis/Joint Job Site Visit Form	Appendix B
Special Isolation Instructions	Appendix C
Electrical Isolation- Specifics	Appendix D
Turnarounds	Appendix E
Deviation Request Form	Appendix F
Tags and Locks	Appendix G
RI-9900 - Audit Form	Appendix H
Special Procedures Involving Electrical Switch Cards	Appendix I
Working on Live Relief Systems	Appendix J

Other Guidance Documents

Section seven of the SWP is Other Guidance Documents. Table 4.1 lists documents used in this RI. You will recognize these documents as other Refinery Instructions.

Table 4.1 – Other Guidance Documents

Title	File/Link Name
RI-314 "Protective Clothing and Safety Equipment"	RI-214
RI-338 "Respiratory Protective Equipment"	RI-338
RI-341 "Hot Work and General Work Permits"	RI-341
RI-366 "Contractor Communication and Training Requirements"	RI-366
RI-370 "Management of Change"	RI-370
RI-380 "Fall Protection"	RI-380
RI-376 "Opening Process Lines"	RI-376
RI-375 "Control of Entry into Process Areas"	RI-375
RI-389 "Electrical Safe Work Practices"	RI-389
RI-374 "Safe Work Practices"	RI-374
RI-366 "Contractors"	RI-366
RI-9920 "General Procedure for Entering and Working in Confined Spaces"	RI-9920

Specific Changes to Body of RI-9900

Table 5 shows specific changes entered into RI-9900.

RI-9900 Changes

Table 5 – Specific Changes to Body of RI-9900

Title of Change	Section	Page #	What it reads
SWP Name	Title Page	1	RI-9900 – Control of Hazardous Energy Lock Out / Tag Out (LOTO) Process for Release of Operating Equipment for Mechanical Work
Purpose, Objectives, Scope, and Management of Change	1.0	3	RI-9900 is the Richmond Refinery's "control of hazardous energy" procedure required by Cal-OSHA Title 8, Section 33.14. The intent of the law is to prevent inadvertent movement of machinery or equipment during repair or servicing by using a lock, chain/cable and tag system (LOTO). Federal OSHA has similar regulations concerning
Purpose	1.1	3	This instruction is the Refinery-wide standard and provides procedures to control hazardous energy prior to releasing equipment for Mechanical work.
Objective	1.2	3	When equipment is locked, tagged, and released in accordance with this Refinery-wide standard incident occurrence is significantly reduced.
Scope	1.3	3	This instruction describes the Lock Out/Tag Out (LOTO) process used for equipment release. All employees and contractors involved with release of and working on Mechanical equipment within the Richmond Refinery follow this instruction.
Management of Change	1.4	3	Exceptions to RI-9900 procedures may only proceed after completing the Management of Change requirements as found in RI-370.
Added to Definitions: Bleeder/Drain –	2.0	3	A low point bleeder going to grade, oily water sewer, relief system or other containment source.
Added to Definitions: Bleeder/Vent –	2.0	4	A high point vent going to the atmosphere or relief system
Added to Definitions: Block Valve –	2.0	4	Valve used for isolation purposes. <u>Check valves</u> are not used for isolation.

RI-9900 Changes

Title of Change	Section	Page #	What it reads
Added to Definitions: Direct Line of Sight and Control	2.0	4	Applies to minor service and repair. Only used in Appendix C – Section 1.6.
Added to Definitions: Electrically De-energize –	2.0	4	<p>To air gap an electrical circuit by one of the following methods:</p> <ul style="list-style-type: none"> ▪ disconnecting the motor lead at the starter ▪ disconnecting the motor leads at the motor junction box ▪ pulling fuses ▪ opening knife blade disconnects ▪ racking out breaker from its cell to the disconnect position <p>NOTE: circuit breakers are not considered de-energized until verified at the START/STOP station.</p>
Added to Definitions: Hazardous Energy -	2.0	4	an energy source that may result in the harm or injury to people, property, or the environment and includes electrical, mechanical, pressure, temperature, chemical, biological, radiation, sound, gravity and motion.
Added to Definitions: Physical Contact -	2.0	5	Mechanical work involving physical contact with the rotating or reciprocating portion of the equipment such as: Working on couplings, pump removal, seals, bearings, bearing brackets, gear drives, or anytime tools are used on the rotating or reciprocating portion of the equipment.
Added to Definitions: Rack Out –	2.0	5	To physically move a “draw out type” circuit breaker to the open position for the purpose of electrical isolation, by use of a crank, motor or other means.
Added to Definitions: Routine Maintenance –	2.0	5	Any work being performed by maintenance personnel, which is not related to turnaround or shutdown work and requires a written work order.
Short Duration Job	2.0	5	Changed Job to Work
Added to Definitions: Twin Seal Valve -	2.0	6	A single block isolation valve.
Body of RI.			
Management	3.1	6	3.1.2 Contract Companies

RI-9900 Changes

Title of Change	Section	Page #	What it reads
Responsibilities			Contract companies working in the Refinery and Chevron Contract Owners are jointly responsible for ensuring employees of the contract firm are knowledgeable of and execute their work in compliance with this instruction.
Operations Responsibilities	3.2	6	<p>The Operator completes an Isolation/Blind List that details isolation points and verification points corresponding to equipment being taken out of service. The list includes blinds, block valves, bleeders, vents, instrumentation, radiation sources, and electrical circuits, and ensures complete isolation and depressurization.</p> <p>Blinds must be listed (one entry per line) on Isolation/Blind List with blind tag number in column number one. Each blind tag section (E-A) is entered on blind tag section of Isolation/Blind List and tracked on this line.</p>
Field verified and signed by Head Operator	3.2.1	7	<ul style="list-style-type: none"> Field verified and signed by Head Operator <p>The Isolation/Blind List must be updated to reflect any changes that occur during the course of work.</p>
Isolation List	3.2.1	7	Appendix A – updated form for routine work.
Shut Down Equipment	3.2.2	7	<ol style="list-style-type: none"> 1. Confirm the start/stop station is left operable to use for isolation verification. 2. Operator "Danger" Tag must be hung at the start/stop station prior to electrician doing work and throughout LOTO job. 3. If the equipment being shut down has a steam driver, then the over speed mechanism is tripped and Operator "Danger" Tag is attached
Equipment 480 volts or below – Involving Physical Contact With Rotating or Reciprocating Equipment	3.2.3	7	<p>Physical contact includes: Working on couplings, pump removal, seals, bearings, bearing brackets, gear drives, or anytime tools are used on the rotating or reciprocating portion of the equipment.</p> <p>This does not include: Inspections or Maintenance work, such as blinding, which <u>does not</u> involve physical contact with the rotating or reciprocating portion of the equipment.</p>

RI-9900 Changes

Title of Change	Section	Page #	What it reads
Equipment 480 volts or below –Not Involving Physical Contact With Rotating or Reciprocating Equipment	3.2.4	8	2. Return to START/STOP station and push the start button to verify equipment does not start.
Clean Equipment	3.2.6	8	<ul style="list-style-type: none"> Ensure equipment is cleaned internally and externally before releasing. Minimize hazards and clean equipment using steam, water, nitrogen, or chemical cleaning. The plant process engineer provides specifics about cleaning methods.
Apply LOTO to Equipment	3.2.7 Item 9	8	<p>When an isolation point (such as a blind or valve) is shared by more than one job, the following tasks must be complete:</p> <ol style="list-style-type: none"> The shared isolation point is included on each job's Isolation/Blind List. Shared isolation points, such as valves, have one isolation lock and tag for each job. Shared blinds have a blind tag for each job. <p>FOR EXAMPLE: Job A and Job B share a blind. The blind has a blind tag for each job. Blind tags remain on blind until both jobs are complete. When both jobs are complete, the blind and tags are removed.</p>
	9a	9	<p>Use Appendix B – JHA/JJSV Form</p> <ol style="list-style-type: none"> Operator is responsible for pushing START button during JJSV and upon Mechanics request.
Observe Work in Progress	3.2.8	10	<ul style="list-style-type: none"> If <u>conditions</u> change, making work unsafe, use "Stop Work Authority" to stop the job.
Electrician Responsibilities	3.3	10	Electrically Qualified Worker
Non- Electrical Craft Responsibilities (Mechanic)	3.5	11	<p>NOTE: The 'Non-Electrical Craft' includes Boiler Makers/Pipefitters, Machinists, Instrument Mechanics, and the General Maintenance Group (aka: Mechanics).</p> <p>Mechanic receives work order and confirms they have a JHA/JJSV form before reporting to the business unit. The first Mechanic of each Craft provides the JJSV/JHA form for use by</p>

RI-9900 Changes

Title of Change	Section	Page #	What it reads
			that Craft.
Non- Electrical Craft Responsibilities (Mechanic)	3.5	11	1. If a red Electrician lock is not installed on the lockbox, then confirm the equipment is electrically powered by a circuit of 480 or less.
Non- Electrical Craft Responsibilities (Mechanic)	3.5.1	12	i. If the scope of the Mechanical work involves physical contact with the rotating or reciprocating portion of the equipment, an Electrician physically disconnects the leads at the motor starter.
Non- Electrical Craft Responsibilities (Mechanic)	3.5.1	12	ii. If the scope of the Mechanical work <u>does not</u> involve physical contact with the rotating or reciprocating portion of the equipment then ...
Non- Electrical Craft Responsibilities (Mechanic)	3.5.1	12	c. Craft Mechanic goes with Operator back to plant equipment. The Operator pushes the start button at the START/STOP station to demonstrate the equipment does not start.
Non- Electrical Craft Responsibilities (Mechanic)	3.5.3 a	12	At anytime during the job, Mechanics can request the Operator demonstrate the equipment is de-energized by pushing the start button.
Non- Electrical Craft Responsibilities (Mechanic)	3.5.12	13	If job scope changes stop the job, contact Operations, and determine if current LOTO is sufficient for work to continue safely.
Instrument Craft Responsibilities	3.6	13	Follow above non-electrical Craft LOTO procedure. For Field Instrumentation Calibration or Repair, go to...
Double Block and Bleed	4.1.2	14	Isolation/Blind List must be modified to reflect alternate isolation method.
Requirements to Use Single Block Isolation	4.1.3	15	Attach Operations "Vent Bleeder Open" tag to the open bleeder valve used to depressurize, drain, or vent equipment and to verify single block isolation has achieved tight shut off.
Requirements to Use Single Block Isolation	4.1.3	15	If tight shutoff cannot be verified, then conduct HSE with appropriate personnel to determine if single block isolation is still the safest and only method to use.
Vent and Drain Bleeder Valves	4.2	15	Vent and drain/ bleeder valves are used with isolation methods to ensure depressurization/draining of process

RI-9900 Changes

Title of Change	Section	Page #	What it reads
			equipment.
Vent and Drain Bleeder Valves	4.2.1	15	Verify bleeder is clear. 1. If bleeder is not clear, then the following methods are acceptable to clear the bleeder: bleeder reamer, ram pump, steam, and nitrogen.
Vent and Drain Bleeder Valves	4.2.2	15	Ensure vents or drains connected to process or closed systems are tagged and locked closed. If flanged, a blind tag is attached and blind is installed.
Vent and Drain Bleeder Valves	4.2.3	16	Vent or drains bleeders going to atmosphere and not connected to other piping must remain open, tagged, and unlocked.
Isolation of Specific Equipment	4.3	16	Refer to Appendix D– Electrical Isolation – Specifics and Appendix C - Special Isolation Instructions
Field Verification of Isolation	4.5	16	4.5.1 – Joint Jobsite Visit (JJSV)
Field Verification of Isolation	4.5	16	4.5.2 – Job Hazard Analysis (JHA)
Equipment Requirements for Lock Out / Tag Out	4.6	17	Equipment is located in a designated storage location within the business unit. The following equipment is required for LOTO: <ul style="list-style-type: none"> ▪ Lockboxes including green Isolation Locks and corresponding key ▪ Operator Lock ▪ Chain/cable ▪ Appropriate Tags - See Table 4.7.1 - Lock/Tag Owners and Color Assignment A standard inventory is maintained at the business unit to ensure there is enough supply of lock boxes, isolation locks, chain/cable, tags and Operator Locks to complete LOTO job(s).
Owners and Color Assignment for Tags and Locks	4.6.1	17	Tags and locks are assigned to work group owners using specific colors. Table 4.6.2 shows Tag / Lock Owners and corresponding color assignment.
Order of Tag Installation	4.6.3	18	Tags and locks are installed in the following order: <ol style="list-style-type: none"> 1. Operator or Utility Operator 2. Isolation Locks

RI-9900 Changes

Title of Change	Section	Page #	What it reads
			3. Electrician 4. Mechanic, Pipefitter, Boilermaker 5. Machinist 6. Instrument Mechanic Upon completion of Mechanical work, tag and lock removal is the reverse of initial placement as listed below: 6. Instrument Mechanic 5. Machinist 4. Mechanic, Pipefitter, Boilermaker 3. Electrician 2. Isolation Locks 1. Operator or Utility Operator NOTE: Tags are removed using a company issued or approved tool, such as wire cutters, side cutters, pliers. Knives are not used for tag removal. <ul style="list-style-type: none"> See Appendix F
Personal Locks	4.7.1	20	Except for breaks and lunch, Personal Locks with appropriate craft tag are attached to the lock box when an individual is working the job and removed when they leave. If Personal Lock is left on the lock box and removal becomes essential, it is only removed by CFD after all reasonable efforts have been made to contact the owner of the lock and tag. <ul style="list-style-type: none"> Approval by the Maintenance Supervisor and Shift Team Leader must be obtained prior to lock and tag removal. The Chevron Fire Dept. removes lock and tag. The employee's supervisor ensures the affected employee is notified of the lock and tag removal and the reason it was necessary at the start of the employee's next shift.
Isolation Lock Removal – Lost Key/No Key	4.7.2	20	Isolation Lock Removal – LOTO Job Complete 1. STL verifies LOTO job is complete. 2. Enter in LPS database as NLI. 3. STL provides written approval (e-mail) to CFD. 4. CFD removes lock and tag.

RI-9900 Changes

Title of Change	Section	Page #	What it reads
Isolation Lock Removal – Lost Key/No Key	4.7.2	20	<p><u>Isolation Lock Removal – LOTO Job Complete</u></p> <ol style="list-style-type: none"> 1. STL verifies with Head Operator LOTO job is complete. 2. STL enters an NLI in LPS database. 3. STL provides NLI number to CFD. 4. Operations conduct JJSV with CFD. 5. CFD removes lock and tag.
Isolation Lock Removal – Lost Key/No Key	4.7.2	20	<p><u>Isolation Lock Removal – LOTO Job NOT Complete</u></p> <ol style="list-style-type: none"> 1. STL does the following: <ol style="list-style-type: none"> a. Verifies LOTO job is NOT complete. b. Starts MOC process. c. STL provides MOC number to CFD. d. Enters LOTO job & MOC number in STL Turnover. e. Contacts HO and instructs them to enter LOTO job and MOC number in Operations Turnover. 2. CFD does the following: <ol style="list-style-type: none"> a. Upon receiving MOC number CFD removes lock and tag. b. Enters this LOTO job in Turnover. <p>NOTE: This situation is rare, but removing the lock and tag from an incomplete LOTO job could compromise safety and mechanical integrity. The MOC process ensures the integrity of the existing system and that the LOTO job is not restarted until all contingencies have been identified and mitigated.</p>
Auditing	5.0	21	<p>OSHA requires periodic inspections be conducted at least annually to ensure procedures outlined in this Refinery Instruction are followed. Audits are used to understand the level of compliance and effectiveness of the Lock Out/Tag Out (LOTO) process so the safety of employees involved in LOTO activities is assured.</p> <p>The intent of the audit process is to identify strengths and improvement opportunities so the LOTO process can be implemented consistently throughout the Refinery.</p> <p>Audits are done during normal business hours when Mechanics are present at the jobsite. This allows dialog between auditors and Mechanics so concerns of the Mechanics and Operators are discussed.</p>

RI-9900 Changes

Title of Change	Section	Page #	What it reads
			<p>Cal-OSHA requires the following to be incorporated into our audit process:</p> <ol style="list-style-type: none"> 1. The audit must be done by an authorized employee other than the one(s) involved in the LOTO job. 2. The audit must be certified (signed) by the auditor and identify the following: <ol style="list-style-type: none"> a. The machine or equipment b. The date of inspection c. The employees involved in the LOTO job (Operator and Mechanic names) d. The person performing the audit 3. The audits must be retained for one year. <ol style="list-style-type: none"> a. The results of the audits must be shared with all affected employees, along with a review of the employee's responsibilities under this instruction. b. The Safety Section will facilitate an annual review of RI-9900. To assist in this process, a copy of each audit is forwarded (or made available electronically) to the Safety Team Lead. <p>Appendix H – RI-9900 Audit Form is the form used to meet audit compliance.</p>
Audit Finding Feedback	5.1	22	<p>Audit findings are reviewed by the Shift Team Leaders with the crews. Discussions of audit findings identify items meeting compliance and explain how to correct deficiencies. This information is entered into the PSM database or in the Audit portion of the Turnover.</p>
Need Craft Removal – LOTO Job NOT Complete – N2 Needed	Appendix C 1.17	35	<p>Maintenance Supervisor does the following:</p> <ol style="list-style-type: none"> 1. Determines which craft locks are removed. 2. Gives work direction to craft representatives by identifying specific craft locks to be removed.

RI-9900 Changes

Title of Change	Section	Page #	What it reads
Need Craft Removal – LOTO Job NOT Complete – N2 Needed	Appendix C 1.17	35	Craft Representative does the following: <ol style="list-style-type: none">1. Removes locks specified by Maintenance Supervisor.2. Completed N2 Testing.3. Upon completion of N2 testing, small locks are replaced.

****End of Specific Changes to RI-9900****

Click on the next page to see RI-9900.



Richmond Refinery

Global Downstream

Safe Work Practice Standard

RI-9900 – Control of Hazardous Energy Lock Out / Tag Out (LOTO) Process for Release of Operating Equipment for Mechanical Work

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1.0 Purpose, Objectives, Scope, and Management of Change

RI-9900 is the Richmond Refinery’s “control of hazardous energy” procedure required by Cal-OSHA Title 8, Section 3314. The intent of the law is to prevent inadvertent movement of machinery or equipment during repair or servicing by using a lock, chain/cable and tag system (LOTO). Federal OSHA has similar regulations concerning the release of hazardous energy that could injure employees during maintenance work, including electrical, mechanical, pressure, temperature, chemical, biological, radiation, sound, gravity and motion.

1.1 Purpose

This instruction is the Refinery-wide standard and provides procedures to control hazardous energy prior to releasing equipment for Mechanical work.

1.2 Objective

When equipment is locked, tagged, and released in accordance with this Refinery-wide standard, incident occurrence is significantly reduced.

1.3 Scope

This instruction describes the Lock Out/Tag Out (LOTO) process used for equipment release. All employees and contractors involved with release of and working on Mechanical equipment within the Richmond Refinery follow this instruction.

1.4 Management of Change

Exceptions to RI-9900 procedures may only proceed after completing the Management of Change requirements as found in RI-370.

2.0 Terms and Definitions

The following are terms and definitions used in this Refinery Instruction:

Blank/Case– approved form of blind only used on a pump volute case when bearing bracket is removed.

Blank/Seal – approved form of blind used on a pump case when seals are removed for service or repair.

Bleeder/Drain – Is a low point bleeder going to grade, oily water sewer, relief system or other containment source.

Bleeder/Vent – a high point bleeder going to the atmosphere or relief system

Blinding – Is the insertion of a solid steel plate between mating flanges or installation of a blind flange on an open flange to prevent liquids, gases, or vapors from passing through a pipeline or nozzle. Blinding is considered Mechanical work.

Block Valve – valve used for isolation purposes. Check valves are not used for isolation. PRD's are not used for isolation.

Business Unit (BU) – the organization responsible for operating equipment within a predefined area

Craft Lock - a color-coded lock used by each Craft.

Craft Mechanic - Maintenance personnel in the following job descriptions; Boilermakers, Electricians, Pipefitters, Machinists, Instrumentation and General Mechanics Group.

Direct Line of Sight and Control - applies to minor service and repair.

Electrically De-energize – To air gap an electrical circuit by one of the following methods:

- Disconnecting the motor lead at the starter
- Disconnecting the motor leads at the motor junction box
- Pulling fuses
- Opening knife blade disconnects
- Racking out breaker from its cell to the disconnect position

NOTE: circuit breakers are not considered de-energized until verified at the START/STOP station.

Electrically Qualified Worker – Is an Electrician or U&E switching Operator trained on the hazards, operation, and maintenance of refinery electrical systems.

Greenfield - A "ground-up" project (i.e., building a new plant)

Hazardous Energy – an energy source that may result in the harm or injury to people, property, or the environment and includes electrical, mechanical, pressure, temperature, chemical, biological, radiation, sound, gravity and motion.

Hot Bolting - Removal of every other fastener (nut and/or stud) on a flange of 8 bolts or more.

Isolation/Blind List - A list produced by Operations identifying all isolation points associated with a particular piece of equipment. Lists include items such as; block valves, blinds, air gapped connections, electrical disconnects, bleeders, vents, and electrical stop/start switch.

Isolation Lock - Is a green colored lock used for locking valves and switchgear for Lockout/Tagout. A set of Isolation locks is assigned to a unique lock box. All isolation locks assigned to that box have the same serial number and can be opened only with the key matching that set of locks. Operators install isolation locks corresponding to an Isolation/Blind List.

Job Hazard Analysis (JHA) - A JHA is a process used to identify safety concerns and minimize hazards at the job site. The JHA is documented on the JHA/JJSV form. Maintenance personnel complete the JHA section of the JHA/JJSV form at the beginning of each maintenance shift.

Joint Jobsite Visit (JJSV) - The JJSV is a dialog or discussion between Maintenance and Operators at the job site. The purpose is to answer questions or concerns regarding the job, preparation of the job site and potential hazardous activities in the plant. The JHA/JJSV form is completed in accordance with this dialog or discussion.

Lock Box - Box containing green Isolation Locks all keyed alike. Boxes are assigned to Business Units and Operations owns the box.

Operating Equipment - Refers to all processing, transfer and storage facilities handling petroleum stocks and associated streams, chemicals, and utilities.

Personal Lock - Is a lock assigned to a specific maintenance person used for Lockout/Tagout. The only person who has keys to this lock is the person to whom the lock is assigned.

Plot Limit - The plot limit is typically the primary location of plant isolation from the rest of the refinery during major shutdown activities, i.e. waterfall or boundary.

Physical Contact - Mechanical work involving physical contact with the rotating or reciprocating portion of the equipment such as: Working on couplings, pump removal, seals, bearings, bearing brackets, gear drives, or anytime tools are used on the rotating or reciprocating portion of the equipment.

Rack Out - To physically move a “draw out type” circuit breaker to the open position for the purpose of electrical isolation, by use of a crank, motor or other means.

Routine Maintenance - Any work being performed by maintenance personnel, which is not related to turnaround or shutdown work and requires a written work order.

Short Duration Work - Typically associated with blind installation or removal against a single block valve. Work must proceed continuously through completion and is completed within a single shift.

Single Stud Replacement - Removal and subsequent replacement of a single stud (or bolt) on a flange of eight or more studs (or bolts).

Turnaround Core Team - Each operating division is assigned a Turnaround Core Team charged with the responsibility of planning and executing small, medium, and complex plant turnarounds. Core Teams are staffed with members representing Operations, Maintenance, Engineering, and Inspection.

Twin Seal Valve - is a single block isolation valve.

3.0 Roles, Responsibilities and Training Requirements

The following define roles, responsibilities and training requirements for this refinery instruction.

3.1 Management Responsibilities

The Business Unit and Maintenance Managers ensure personnel under their direction are trained, prepared, and comply with the requirements of this instruction. This includes implementing an effective audit process to assess the level of compliance and understanding of this instruction, and taking appropriate and timely action to address any deficiencies.

3.1.1 Operations Supervisor/ Shift Team Leader

Assists in preparation and review of shutdown, repair, cleanup, and start-up plans to ensure a safe and complete equipment turnaround.

Reviews audit reports for their facilities and provide appropriate reinforcement to encourage compliance and correct deficiencies.

3.1.2 Contract Company Management and Chevron Contract Owners

Contract companies working in the Refinery and Chevron Contract Owners are jointly responsible for ensuring employees of the contract firm are trained, prepared, and comply with the requirements of this instruction. Go to [RI-366 - Contractor Communication and Training Requirements](#) for details.

3.2 Operator Responsibilities

3.2.1 Complete Isolation Blind List

The Operator completes an Isolation/Blind List that details isolation points and verification points corresponding to equipment being taken out of service. The list includes blinds, block valves, bleeders, vents, instrumentation, radiation sources, and electrical circuits, and ensures complete isolation and depressurization.

Blinds must be listed (one entry per line) on Isolation/Blind List with blind tag number in column number one. Each blind tag section (E-A) is entered on blind tag section of Isolation/Blind List and tracked on this line.

See Appendix A – [Isolation/Blind List For Routine Maintenance](#).

Isolation/Blind Lists must be:

- Prepared by Operations
- Field verified and signed by Head Operator
- Original kept with lockbox (tube)
- Copies kept in control room

The Isolation/Blind List must be updated to reflect any changes that occur during the course of work.

3.2.2 Shut Down Equipment

The Operator is responsible for ensuring all personnel are clear of hazards which might result from the equipment being energized/de-energized.

1. Confirm the START/STOP station is left operable to use for electrical isolation verification.
2. Operator “Danger” Tag must be hung at the START/STOP station prior to electrician doing work and it is the only tag hung on the START/STOP station throughout LOTO job.
3. If the equipment being shut down has a steam driver, then the overspeed mechanism is tripped and Operator “Danger” Tag is attached.

3.2.3 De-energize Equipment 480 Volts or Below – Involving Physical Contact with Rotating or Reciprocating Equipment

When the scope of the Mechanical work involves physical contact with the rotating or reciprocating portion of the equipment, an Electrician physically disconnects the leads at the motor starter.

Physical contact includes: Working on couplings, pump removal, seals, bearings, bearing brackets, gear drives, or anytime tools are used on the rotating or reciprocating portion of the equipment.

This does not include: Inspections or Maintenance work, such as blinding, which does not involve physical contact with the rotating or reciprocating portion of the equipment.

3.2.4 De-energize Equipment 480 Volts or Below – Not Involving Physical Contact with Rotating or Reciprocating Equipment

If equipment is 480 volts or below and does not use a draw-out type circuit breaker, the Plant Operator electrically de-energizes the equipment. Most 480-volt motors use a combination circuit breaker/motor starter. This type of electrical disconnect has a simple lever type handle that does not require the Plant Operator to open the cabinet or use any tools (such as a crank) to de-energize the equipment.

1. Turn the circuit breaker to the “OFF” position and lock it in that position using a green Isolation Lock and Operations “Danger” tag.
2. Return to START/STOP station and push the start button to verify equipment does not start.

3.2.5 Identify Circuits Higher Than 480 Volts

Circuits higher than 480 volts or protected by other types of Electrical Isolation Devices (EIDs) must be operated and isolated by an Electrician or Electrically Qualified Worker. Draw-out type circuit breakers are racked out by physically moving the breaker to the open position using a crank, motor, or other means. Specific PPE and training is required for this type of breaker.

3.2.6 Clean Equipment

1. Ensure equipment is cleaned internally and externally before releasing. Minimize hazards and clean equipment using steam, water, nitrogen, or chemical cleaning. The plant process engineer provides specifics about cleaning methods.
2. When available, follow plant procedures that list specific instructions for cleaning/preparing equipment for release.
3. MOC is used to manage highly specialized situations.

3.2.7 Apply LOTO to Equipment

1. Use cable or chain and Operator Lock to attach lockbox to jobsite.
2. Follow Isolation/Blind List to isolate equipment using Isolation Locks, chains, cables, “Danger” tags, Vent /Drain Bleeder Open tags, and Blind tags until Isolation/Blind List is complete.
3. Insert Isolation/Blind List into lockbox tube.

4. Place the key to the Isolation Locks in the lockbox.
5. Lock the lockbox using an Operator Lock and attach Operator “Danger” tag.
6. If a job requires more than the standard lock box with 10 lock capacity, then request larger lock box with 15 or 20 lock capacity from CTR. All Craft and Personal Locks are attached to this box. Group lock out clips can be used if needed.
7. When an isolation point (such as a blind or valve) is shared by more than one job, the following tasks must be complete:
 - a. The shared isolation point is included on each job’s Isolation/Blind List.
 - b. Shared isolation points, such as valves, have one isolation lock and tag for each job.
 - c. Shared blinds have a blind tag for each job.

FOR EXAMPLE:

Job A and Job B share a blind. The blind has a blind tag for each job. Blind tags remain on blind until both jobs are complete. When both jobs are complete, the blind and tags are removed.

8. Notify appropriate Craft LOTO is complete.
9. Perform a Joint Jobsite Visit (JJSV) with Maintenance Craft personnel (Use Appendix B – [JHA/JJSV Form](#)).
 - a. Operator is responsible for pushing START button during JJSV and upon Mechanics request.
 - b. Before equipment is released for Mechanical work, a written/hard copy work order describing the specific tasks and scope of the work must be issued.
 - c. Release the equipment for Mechanical work by signing the Work Order.
 - d. In case the work request database is not available, then the JJSV form serves as the work order.
 - e. Equipment without a work order or JJSV is **not** released for Mechanical work.

3.2.8 Observe Work in Progress

1. The Operator in charge of plant equipment remains in the vicinity until they verify work is progressing safely.
2. During work progress, the Operator inspects the job site throughout the shift to ensure safe conditions are maintained.
3. If conditions change, making work unsafe, use “Stop Work Authority” to stop the job.

3.3 Electrician Responsibilities

An Electrician or Electrically Qualified Worker is required to de-energize the following:

Electric motor-driven rotating or reciprocating equipment when the scope of the Mechanical work involves physical contact with the rotating or reciprocating portion of the equipment:

- Draw-out type motor starter
 - Circuit protected by fuses
 - Open air switches, or requiring opening of the electrical enclosure
 - Circuits powering fin-fans, conveyors, or tank mixers
 - See Appendix C - Special Isolation Instructions
- 3.3.1 Electrician receives work order and confirms they have a [JHA/JJSV](#) form before reporting to the business unit. Check in at the Control Room and follow [RI - 375](#) - Control of Entry.
 - 3.3.2 Electrician Reviews the work with the Operator.
 - 3.3.3 Electrician and Operator jointly complete the JJSV portion of the JHA/JJSV form prior to the Electrician starting work.
 - 3.3.4 Electrician has the Operator sign the work order. This releases the Electrical Isolation Device (EID) for isolation.
 - 3.3.5 Electrician goes with the Operator to the EID.
 - 3.3.6 Electrician performs an Electrical Lockout/Tagout of equipment per Appendix D- Electrical Isolations - Specifics

- 3.3.7 Electrician attaches an electrical Craft lock with Electrician's "Danger" tag to the EID. The Electrician watches the Operator install an Isolation Lock and Operations "Danger" tag to the EID.
- 3.3.8 Electrician returns with Operator to START/STOP station. The Operator is responsible for ensuring all personnel are clear of hazards which might result from the equipment being energized/de-energized. The Operator pushes the start button to demonstrate equipment does not start.
- 3.3.9 Electrician watches Operator deposit the Isolation Lock key in the lockbox and attach Operations lock with Operations "Danger" tag. The Electrician attaches Electrician's "Danger" tag and Craft lock to the lockbox latch.

3.4 Additional Electrical Work

- 3.4.1 If other electrical work is performed on the circuit, aside from the electrical tagout, a [JHA](#) is performed.
- 3.4.2 While other electrical work is being performed, the Electrician is required to attach their Personal Lock and tag to the lockbox in addition to the Electrician's Craft lock and tag.
- 3.4.3 When work is complete, or the end of the Electrician's shift, the Personal Lock and tag are removed and the Electrician's Craft lock and tag remain as long as the circuit is electrically tagged out.
- 3.4.4 Except for breaks and lunch periods, when Electrician leaves the job site, they must remove Personal Locks and tags.

3.5 Non-Electrical Craft Responsibilities (Mechanic)

NOTE: The 'Non-Electrical Craft' includes Boiler Makers/Pipefitters, Machinists, Instrument Mechanics, and the General Maintenance Group (aka: Mechanics).

Mechanic receives work order and confirms they have a [JHA](#)/JJSV form before reporting to the business unit. The first Mechanic of each Craft provides the JJSV/JHA form for use by that Craft. Check in at the Control Room and follow [RI-375](#) - [Control of Entry](#).

- 3.5.1 **Go to the job site** and review the work with plant Operator.
 - 1. If a red Electrician lock is not installed on the lockbox, then confirm the equipment is electrically powered by a circuit of 480 or less.

- a. **Over 480 volts or draw-out type breaker** - If the equipment is electrically powered by a circuit over 480 volts then do not proceed until an Electrician has de-energized the equipment.
 - b. **For 480 volts and below and not using a draw-out type circuit breaker:**
 - i. If the scope of the Mechanical work involves physical contact with the rotating or reciprocating portion of the equipment, an Electrician physically disconnects the leads at the motor starter.
 - ii. If the scope of the Mechanical work does not involve physical contact with the rotating or reciprocating portion of the equipment, then the first craft Mechanic to work the job must accompany the Operator to the Electrical Isolation Device (EID) and confirm the placement of a green Isolation Lock. At this time the first craft Mechanic places their Craft tag and lock on the EID.
 - c. Craft Mechanic goes with Operator back to plant equipment. The Operator pushes the start button at the START/STOP station to demonstrate the equipment does not start.
- 3.5.2 Complete a JJSV with the plant Operator **at the job site**.
- 3.5.3 The JJSV requires the Operator field demonstrate to each Craft that equipment is isolated and depressured per the Isolation/Blind List.
- a. At anytime during the job, Mechanics can request the Operator demonstrate the equipment is de-energized by pushing the start button.
- 3.5.4 Refinery Boilermakers/Pipefitters, Machinists, and Instrument Mechanics (each Craft) performs initial JHA at the job site.
- 3.5.5 The first Craft Mechanic witnesses the Operator placing the job Isolation Lock key in the lockbox before attaching the first Craft lock to the lockbox.
- 3.5.6 The Craft lock and Craft “Danger” Tag is installed on the lock box latch and remains in place for the duration of the Craft activity.
- 3.5.7 A copy of the completed [JHA](#) form stays in the field at the lockbox location with the Isolation/Blind List.
- 3.5.8 Prior to beginning work on isolated equipment each Mechanic ensures the following is complete:

1. Review Isolation/Blind List and confirm isolation and vent/bleeder points
 2. Confirm lockbox has Operations and Craft locks/tags attached
 3. [JHA](#) form per Craft is complete
- 3.5.9 Mechanic has Operator sign work order. This releases equipment to Maintenance.
- 3.5.10 Mechanics attach black Personal Lock with a Craft tag to the lockbox. Personal locks must be attached to lockbox by each individual Mechanic while working on equipment.
- 3.5.11 Except for breaks and lunch periods, when Craft Mechanics leave the job site, they must remove Personal Locks and tags.
- 3.5.12 If job scope changes stop the job, contact Operations, and determine if current LOTO is sufficient for work to continue safely.

3.6 Instrument Craft Responsibilities

Follow above non-electrical Craft LOTO procedure.

For Field Instrumentation Calibration or Repair, go to Appendix C/Section 1.6.3 - [Special Isolation Instructions](#).

4.0 Isolation and Verification Procedures for Routine Maintenance (Non-Turnaround or Non-Greenfield Work)

Reference Note: For Turnaround –See Appendix E

There are three standard isolation methods that ensure “control of energy for process fluids.” In order of priority these are:

1. Plate Blinding
2. Double Block and Bleed
3. Single Block

For Special Isolation Instructions see Appendix C.

Vent and Drain Bleeder Valves are **not** isolation points but must be listed and tracked on the Isolation/Blind List as verification points.

4.1 Isolation Procedures

4.1.1 Plate Blinding

The preferred method for piping and equipment isolation is plate blinding.

Operator confirms the following:

- Operations “Danger” tags attached to each isolation point using self locking 50# breaking strength attachment.
- Isolation locks with chains or cables attached to valves providing isolation.
- Multi-section blind tag (GO-1497) as close as possible to the flange being blinded.
- Operations “Vent Bleeder Open” tag attached to open bleeder valves used to depressurize or vent equipment.

Isolation for blind installation/removal using a single isolation valve is permitted providing tight shut off is confirmed and work is short duration.

If tight shutoff is not confirmed, then perform a Health and Safety Evaluation (HSE) with appropriate personnel before proceeding. Go to [RI-370](#) – Management of Change.

4.1.2 Double Block and Bleed (DB&B)

DB&B is an acceptable alternative to blinding when tight shut off of block valves is confirmed. The **bleeder valve must remain locked open**. DB&B is identified and tracked using a blind tag.

NOTE: Double block and bleed is generally not acceptable for confined space entry. For confined space entry follow [RI-9920 - General Procedure for Entering & Working in Confined Areas – Section 8](#) for specific instructions. A single twin seal valve and bleeder does not constitute DB&B.

Operator confirms the following:

1. Operations “Danger” tags are attached to each isolation valve using self locking 50# breaking strength attachment.
2. Operations “Vent Bleeder Open” tag is attached to all **open** bleeder valves at DB&B isolation point. Bleeder valves must remain **locked open**.
3. If it is necessary to close a DB&B bleeder valve, then this method is compromised and no longer valid. Work must be stopped and

an alternate isolation method is required. Isolation/Blind List must be modified to reflect alternate isolation method.

4. Isolation locks with chains or cables are attached to valves providing isolation.

4.1.3 Requirements to Use Single Block Isolation

Use of Single Block Isolation requires one of the following:

- Approved isolation process described in Appendix C - Special Isolation Instructions

OR

- Approved Deviation Request Form - RI-9900 - Appendix F

Single Block Isolation is used if double block and bleed is not an option or if the task of installing a blind is more hazardous than working against a single block. Single Block Isolation is the least desirable isolation method. In some circumstances it is the only option. It is not acceptable for confined space entry/isolation (see [RI-9920](#)).

Operator completes the following:

1. Confirm the isolating block valve achieves tight shutoff.
2. Attach Operations “Danger” tag to the isolation point using self locking 50# breaking strength attachment.
3. Attach Isolation lock with chain or cable to the valve providing isolation. You can lock multiple valves with a single lock.
4. Attach Operations “Vent Bleeder Open” tag to the open bleeder valve used to depressurize, drain, or vent equipment and to verify single block isolation has achieved tight shut off.
5. **If tight shutoff cannot be verified, then do not proceed until an HSE is conducted with appropriate personnel to determine if single block isolation is still the safest and only method to use.**

4.2 Vent and Drain Bleeder Valves

Vent and drain bleeder valves are used with isolation methods to ensure depressurization/draining of process equipment.

- 4.2.1. Operator verifies bleeder is clear.

1. If bleeder is not clear, then the following methods are acceptable to clear the bleeder: bleeder reamer, ram pump, steam, and nitrogen.
- 4.2.2 Ensure vents or drains connected to process or closed systems are tagged and locked closed. If flanged, a blind tag is attached and blind is installed.
- 4.2.3 Vent or drain bleeders going to atmosphere and not connected to other piping must remain open, tagged, and unlocked.

4.3 Isolation of Specific Equipment

Refer to Appendix D - Electrical Isolation- Specifics and Appendix C – Special Isolation Instructions for a description of approved isolation procedures for specific circumstances and equipment types not included in the above.

4.4 Use of Chain or Cable

Steel chain or cable is used for LOTO isolations. Plastic or other lightweight materials are not acceptable. The terms “chain” and “cable” are used interchangeably in this instruction.

4.5 Field Verification of Isolation

Field verification, by Operations and Maintenance, ensures energy sources are isolated and remain isolated during the time equipment is released.

4.5.1 Joint Jobsite Visit (JJSV)

The JJSV is completed at the beginning of every maintenance shift at the jobsite. The JJSV requires a dialog between Maintenance and Operators and answers questions or concerns they have regarding the job, preparation of the jobsite, and potential hazardous activities in the plant.

The JJSV is done with each Mechanic new to the job unless other Mechanics representing the same Craft are currently on the jobsite and available to explain the job, the hazards and preparation of the jobsite to the new Mechanic. Prior to starting work, any Craft Mechanic can request a JJSV.

Appendix B - JHA/JJSV is the form used to perform the JJSV and JHA. A JJSV includes:

1. Use of the job Isolation/Blind List to verify equipment isolation and depressurization points.
2. A verification of electrical isolation by Operator pressing start button.

3. Before work starts discuss hazards (chemical/physical) and safety requirements related to the work and the surrounding area along with the requirements specified on work permits. Include applicable MSDS numbers.

4.5.2 Job Hazard Analysis (JHA)

A JHA is a completed Audit by each Craft at the jobsite at the beginning of each maintenance shift prior to working on the equipment. When the JHA is complete, it stays with the lockbox until the job is finished (see Appendix B – [JHA/JJSV Form](#)).

4.6 Equipment Requirements for Lock Out/Tag Out

Equipment is located in a designated storage location within each area business unit. The following equipment is required for LOTO:

- Lockboxes including green Isolation Locks and corresponding key
- Operator Lock
- Chain/cable
- Appropriate Tags - See Table 4.7.1 - Lock/Tag Owners and Color Assignment

A standard inventory is maintained at each area business unit to ensure there is enough supply of lock boxes, isolation locks, chain/cable, tags, and Operator Locks to complete LOTO job(s).

4.6.1 Owners and Color Assignment for Tags and Locks

Tags and locks are assigned to work group owners using specific colors. Table 4.6.2 shows Tag / Lock Owners and corresponding color assignment.

4.6.2 Table - Lock/Tag Owners and Color Assignment

	Lock or Tag	Owner	Color Assignment
1.	Operator “Danger” Tag (GO-1493)	Operator	Yellow
	Utilities Operator “Danger” Tag (GO-1495)	Operator	Brass locks and Red/White tags
2.	Vent Bleeder Tag (MFG-4515)	Operator	Yellow and Black checkerboard
3.	Isolation Locks (LOTO)	Operator	Green

	Lock or Tag	Owner	Color Assignment
4.	Electrician “Danger” Tag (GO-1492)	Electrician	Red
5.	Mechanic, Pipefitter, Boilermaker “Danger” Tag (GO-1494)	Pipefitter Boilermaker	Blue
6.	Machinist “Danger” Tag (GO-1570)	Machinist	Blue/Orange
7.	Instrument Mechanic “Danger” Tag (GO-1705)	Instrument	Gray
8.	Black Personal Locks	Chevron Employees	Black (with CAI or numbered) & Craft tag
9.	Silver Personal Locks	Contractors	Silver with Craft tag
10.	Multi-Section Blind Tag (GO-1497)	Operator	Multi-colored – red, white, blue and yellow
11.	Multi-Section Valve Repair Tag (GO-1496-BL)	Operator	Pink and Red
12.	Multi-Section Relief Valve Tag (GO-1496)	Operator	Red

4.6.3 Order of Tag and Lock Installation

Tags and locks are installed in the following order:

1. Operator or Utility Operator – Yellow or Red & White – this placement indicates “DO NOT REPOSITION”. If it’s OFF leave it OFF, if it’s ON leave it ON. If it’s CLOSED, leave it CLOSED. If it’s OPEN, leave it OPEN.
2. Isolation Locks – ensures isolation status remains constant and is not randomly changed without following established procedures.
3. Operator Lock – is attached after first Craft Mechanic lock is attached.
4. Electrician – confirms electrical work is being performed at job site.

5. Mechanic, Pipefitter, Boilermaker - confirms mechanical work is being performed at job site.
6. Machinist - confirms mechanical work is being performed at job site.
7. Instrument Mechanic - confirms instrument work is being performed at job site.

4.6.4 Upon completion of Mechanical work, tag and lock removal is the reverse of initial placement as listed below:

7. Instrument Mechanic – removal of tag confirms all instrument work is complete.
6. Machinist – removal of tag confirms all machinist work is complete.
5. Mechanic, Pipefitter, Boilermaker – removal of tag confirms all mechanical work is complete.
4. Electrician – removal of tag confirms all electrical work is complete.
3. Operator Lock – removal of lock confirms all craft work is complete.
2. Isolation Locks – removal of locks confirms one or both of the following conditions:

The Operator is responsible for ensuring all personnel are clear of hazards which might result from the equipment restoring hazardous energy.

- a. Equipment is ready to be tested
 - b. Equipment is ready to be placed back into service.
1. Operator or Utility Operator – removal of tag confirms one or both of the following conditions:
 - a. Equipment is ready to be tested
 - b. Equipment is ready to be placed back into service.
- Tags must be signed and dated legibly by the individual attaching it. It must identify the equipment and the reason tagged.
 - “DANGER” tags are attached to isolation, Operator, Craft, or Personal Locks when installed.
 - When attaching tags to equipment without locks “Danger” Tags must be attached using a self-locking, 50# breaking strength attachment.

Reminder: Tags are removed using a company issued or approved tool, such as wire cutters, side cutters, pliers. Knives must not be used for tag removal.

- See Appendix G– Tags and Locks for details regarding tags and locks relating to this instruction.

4.7 Locks

4.7.1 Personal Locks

Except for breaks and lunch, Personal Locks with appropriate craft tag are attached to the lock box when an individual is working the job and removed when they leave.

If Personal Lock is left on the lock box and removal becomes essential, it is only removed by CFD after all reasonable efforts have been made to contact the owner of the lock and tag.

- Approval by the Maintenance Supervisor and Shift Team Leader must be obtained prior to lock and tag removal.
- The Chevron Fire Dept. removes lock and tag.
- The employee's supervisor ensures the affected employee is notified of the lock and tag removal and the reason it was necessary at the start of the employee's next shift.

4.7.2 Isolation Lock Removal – Lost Key/No Key

Isolation Lock Removal – LOTO Job Complete

1. STL verifies with Head Operator LOTO job is complete.
2. STL enters an NLI in LPS database.
3. STL provides NLI number to CFD.
4. Operations conducts JJSV with CFD.
5. CFD removes lock and tag.

Isolation Lock Removal – LOTO Job NOT Complete

1. STL does the following:
 - a. Verifies with Head Operator LOTO job is NOT complete.
 - b. Starts MOC process.

- c. Provides MOC number to CFD.
 - d. Enters LOTO job & MOC number in STL Turnover.
 - e. Contacts HO and instructs them to enter LOTO job and MOC number in Operations Turnover.
2. CFD does the following:
- a. Upon receiving MOC number CFD removes lock and tag.
 - b. Enters this LOTO job in Turnover.

NOTE: This situation is rare, but removing the lock and tag from an incomplete LOTO job could compromise safety and mechanical integrity. The MOC process ensures the integrity of the existing system and that the LOTO job is not restarted until all contingencies have been identified and mitigated.

5.0 Auditing

OSHA requires periodic inspections be conducted at least annually to ensure procedures outlined in this Refinery Instruction are followed. Audits are used to understand the level of compliance and effectiveness of the Lock Out/Tag Out (LOTO) process so the safety of employees involved in LOTO activities is assured.

The intent of the audit process is to identify strengths and improvement opportunities so the LOTO process can be implemented consistently throughout the Refinery.

Audits are done during normal business hours when Mechanics are present at the jobsite. This allows dialog between auditors and Mechanics so concerns of the Mechanics and Operators are discussed.

Cal-OSHA requires the following to be incorporated into our audit process:

- 1. The audit must be done by an authorized employee other than the one(s) involved in the LOTO job.
- 2. The audit must be certified (signed) by the auditor and identify the following:
 - a. The machine or equipment
 - b. The date of inspection
 - c. The employees involved in the LOTO job (Operator and Mechanic names)
 - d. The person performing the audit

3. The audits must be retained for one year.
 - a. The results of the audits must be shared with all affected employees, along with a review of the employee's responsibilities under this instruction.
 - b. The Safety Section will facilitate an annual review of LOTO Process. To assist in this process, a copy of each audit is forwarded (or made available electronically) to the Safety Team Lead.

Appendix H – [RI-9900 Audit Form](#) is the form used to meet audit compliance.

5.1 Audit Finding Feedback

Audit findings are reviewed by the Shift Team Leaders with the crews. Discussions of audit findings identify items meeting compliance and explain how to correct deficiencies.

This information is entered into the PSM database or in the Audit portion of the Turnover.

6.0 References

Document List

Title	File/Link Name
Cal OSHA Title 8, Section 3314	
RI-314 "Protective Clothing and Safety Equipment"	RI-314
RI-338 "Respiratory Protective Equipment"	RI-338
RI-341 "Hot Work and General Work Permits"	RI-341
RI-366 "Contractor Communication and Training Requirements"	RI-366
RI-370 "Management of Change"	RI-370
RI-380 "Fall Protection"	RI-380
RI-376 "Opening Process Lines"	RI-376
RI-375 "Control of Entry into Process Areas"	RI-375
RI-389 "Electrical Safe Work Practices"	RI-389
RI-374 "Safe Work Practices"	RI-374
RI-366 "Contractors"	RI-366
RI-9920 "General Procedure for Entering and Working in Confined Spaces"	RI-9920
RI-9020 "Radioactive Material"	RI-9020

Title	File/Link Name

7.0 Revision History

Revision History

Description	Revision Record
Revision Date	February 2010
Next Revision Due	February 2013
Control Number	RI-9900

Amendment Details

Amendment Date	Detail

****End of RI-9900 Body****
****Appendixes Start on Next Page****

Appendix B: Job Hazard Analysis/Joint Job Site Visit Form

[Click here](#) to view electronic copy of Job Hazard Analysis Form

CHEVRON JOB HAZARD ANALYSIS FORM				
NOTE: This form is to be brought to the work site by the first representative of each craft.				
DATE:		JOB NO.:		LOCATION:
MAINT. SUPERVISOR:				PHONE NO.:
OPERATOR:				PHONE NO.:
<u>MECHANIC'S NAME</u>		<u>CRAFT</u>		<u>COMPANY</u>
JOINT JOB SITE VISIT (JJSV) – Operator/Mechanic Discussion Completed? -->				
Isolation List: Review list, operator points out all isolation and depressurization points.				<input type="checkbox"/> Yes <input type="checkbox"/> N/A
Electrical Isolation Verification: Electrician lock on lockbox, test start/stop switch.				<input type="checkbox"/> Yes <input type="checkbox"/> N/A
Isolation Lock Key: If no electrician, first craft representative witnesses key deposited in lockbox.				<input type="checkbox"/> Yes <input type="checkbox"/> N/A
Locks and Tags Installed: Confirm that all locks and tags are installed per RI-9900.				<input type="checkbox"/> Yes <input type="checkbox"/> N/A
Additional Work Permits reviewed and signed—check those that apply: <input type="checkbox"/> Ignition Source <input type="checkbox"/> High Heat <input type="checkbox"/> Fresh Air <input type="checkbox"/> General Work <input type="checkbox"/> Excavation <input type="checkbox"/> Confined Space <input type="checkbox"/> Other				<input type="checkbox"/> Yes <input type="checkbox"/> N/A
Hazardous Materials: Material: _____ MSDS No.: _____				<input type="checkbox"/> Yes <input type="checkbox"/> N/A
Personal Protective Equipment reviewed—check those that apply: <input type="checkbox"/> Respirator <input type="checkbox"/> Hearing Protection <input type="checkbox"/> Goggles <input type="checkbox"/> Faceshield <input type="checkbox"/> Chemical Suit <input type="checkbox"/> Chemical Gloves				<input type="checkbox"/> Yes <input type="checkbox"/> N/A
Safety Equipment identified: Eyewash/Safety Shower, Fire Equipment.				<input type="checkbox"/> Yes <input type="checkbox"/> N/A
Nearby Jobs That Pose Additional Hazards reviewed.				<input type="checkbox"/> Yes <input type="checkbox"/> N/A
Hazardous Nonroutine Maintenance: (i.e., in-plant hot work, hot taps, leak seals, live relief, Scott Air). Discuss what could go wrong. Consider alternative solutions. Consider raising the approval level. Confirm that it is safe to proceed.				<input type="checkbox"/> Yes <input type="checkbox"/> No
JOB HAZARD ANALYSIS (JHA) – Mechanical Craft discussions below. Also review JJSV items above.				
General Questions		Yes	No	N/A
Evacuation assembly area known?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Emergency action plan reviewed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fall Protection required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MSDS's Reviewed with crew/on-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Barricade tape/fence/shield?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
General Questions		Yes	No	N/A
Staging required/tagged appropriately?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Crane/lifting equipment required?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Proper lighting/night work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Housekeeping?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SAFETY REMINDERS – Review these items before starting work.				
Safety behaviors discussed		Pinch points/line of fire		
Basic PPE: Head/Eye/FR clothing/gloves/footwear		Flying particles/sharp objects/hot surfaces		
Proper tools and equip./use/condition		Permissible Exposure Limits		
Flammables properly stored		Inert atmospheres/surroundings		
Slipping/tripping hazards		Critical lift plan		
COMMENTS from above JJSV and JHA reviews:				

MS FrontPage/refinery/ref_inst/RI-New/ri-9900/app8-jobhazanalysis.doc -1- 10/14/03

Appendix C: Special Isolation Instructions

- 1.0 The Special Isolation Instructions listed are approved for situations when the standard process described in the body of RI-9900 is impractical or additional precautions must be taken. Unless otherwise described in this section, Operators perform equipment isolation; i.e., open and close valves and install isolation locks.

1.1 Heat Exchangers

When leaks are identified or suspected assume that stocks transfer between the shell and tube side. For hazardous hydrocarbons such as LPG, H₂S, NH₃, Benzene or other hazardous material, exposure is immediately dangerous to life and health (IDLH).

1. Determine the most hazardous side
2. Install blinds on the most hazardous side first.
3. The Head Operator (or their delegate) determines and identifies the most hazardous side.
4. Blinding order is specified in writing on the isolation/blind list/work order.
5. If two or more exchangers are in an uninterrupted series configuration they can be considered a single unit and cleaned up & isolated for repairs.

1.2 Pumps

Pump assemblies typically consist of a driver, a coupling, and a pump. Unless a section is physically disconnected from the others, the pump is isolated as an assembly—all hazardous energy is isolated from each section prior to proceeding with mechanical work.

The following are exceptions to standard isolation procedures:

Hot Alignment

1. Leave the electrical driver isolated
2. If driver is a steam turbine leave exhaust valve open to warm up the turbine.
3. Pump block valves remain open during hot alignment

Removal and re-installation of bearing bracket assembly

1. [Operations] Pump driver is isolated (de-energized).

2. [Operations] Suction and discharge valves are closed.
3. [Maintenance] If block valves leak, install isolation blinds. If isolation blinds are installed then case blank is not necessary.
4. [Operations] Pump case is drained and Vent Bleeder Open Tag is attached.
5. [Maintenance] Confirm blinds meet applicable engineering specifications.
6. [Maintenance] Remove the bearing bracket element and bolt a gasketed case blind (blank) on the volute case.

Seal removal and re-installation

1. [Operations] Pump driver is isolated (de-energized).
2. [Operations] Suction and discharge valves are closed.
3. [Maintenance] If block valves leak, install isolation blinds. If isolation blinds are installed then seal blank is not necessary.
4. [Operations] Pump case is drained and Vent Bleeder Open Tag is attached.
5. [Maintenance] Confirm seal blank meets applicable engineering specifications.
6. [Maintenance] Remove the mechanical seal and bolt gasketed seal blank on the pump.

Inspection of mechanical seals, couplings or bearings

Pumps being isolated solely for inspection of mechanical seals, couplings or bearings are isolated using the single block isolation method.

Mist Lubrication

Unless the pump is removed for repairs the mist lubrication connections need not be broken or removed when a pump is worked on.

1.3 Cooling Tower and Air Cooler Fans

Determine if entry into cell or shroud is required. If so, then follow the requirements of [RI-9920 – Confined Space Entry](#).

Rotating fans are a source of hazardous energy and must be tied off

1. Perform “electrical Lock Out/ Tag Out”

2. Disconnect motor leads and visually expose the physical disconnect at the motor junction box where mechanics and operators can visually see and verify the disconnection.

1.4 Reciprocating Compressors

Isolation of this type of equipment poses an unusual hazard. Before beginning work, **all** cylinders must be de-pressured and isolated to prevent inadvertent movement of the crankshaft. Isolate and blind as per this refinery instruction.

Whenever work is performed within reciprocating compressor cylinders or within a crankcase the following additional safety precautions must be followed:

1. Vent the suction and discharge lines to each cylinder and tag.
2. Use a jacking motor or crosshead blocks to prevent inadvertent movement.

1.5 Hot Bolting or Single Stud Replacement

Hot bolting of any equipment requires a Management of Change process including an Engineering Review and creating specific operating procedures that detail allowable temperature and pressure limits.

Single stud replacement on flanges with **fewer than 8 bolts** requires the same approval process as Hot Bolting.

Single stud replacement on flanges of **8 or more bolts** requires the operator and mechanic to complete a Health and Safety Evaluation and Head Operator approval before the job is started.

1.6 Minor Service and Repairs

****Use of Direct Line of Sight and Control starts here****

Cal-OSHA allows for exceptions to the lockout process for minor servicing activities, if they are routine, repetitive and integral to the use of the equipment for production.

Minor servicing activities may be performed using a tagout process if the:

1. Isolation valves are in direct line of sight and control of the person doing the work.

2. Isolation points must be closed and tagged with the worker's completed DANGER tags.
3. Work is continuous and the worker does not leave the jobsite.
4. If the conditions listed above are not met then craft locks and tags must be installed on the valves, or other means of positive isolation must be used.

1.6.1 Minor Service and Repairs performed by Operations

Minor servicing activities use a tagout process for:

- a. Replacement of pressure gauges
- b. Connecting utility or washdown hoses
- c. Replacing inline suction filters

1.6.2 Steam Trap Repair or Replacement

- a. Operations approve the Maintenance list of steam traps scheduled for repair
- b. Perform a JJSV and confirm locations of isolation valves

Maintenance completes the following:

- a. Test the traps for operation
- b. Verify the appropriate valves are closed
- c. Attach Craft Tag to valves
- d. Repair or replace the trap
- e. Return the trap to service
- f. Remove tags
- g. Notify Operations that repair is complete

1.6.3 Field Instrumentation Calibration or Repair

If the following conditions are met then Mechanics open and close instrument manifold and instrument root valves during routine calibration and servicing of field instruments and analyzers:

- a. A JJSV is performed including confirmation of the instrument to be worked on and the isolation valve locations.

Exception: A JJSV is not required for routine, repetitive servicing or calibration of analyzers by regularly assigned personnel.

- b. Prior to working on an instrument the mechanic notifies Operations so stable process control is not compromised.
 - i. If the instrument being removed is connected by any means other than tubing leads or sample lines, then Operations isolates the equipment following standard isolation and LOTO procedures. Examples: displacers, floats or control valves.
 - ii. If removing instruments such as (Honeywell Field Termination Assemblies, 24 Volts DC alarms, 24 Volts DC Programmable Logic Controllers) that are 30 Volts DC or less, with no hazardous potential, then the electrical circuit is not considered part of the isolation. If this is the only task then the standard LOTO procedures do not apply to this electrical disconnects.

****Use of Direct Line of Sight and Control ends here****

1.7 Testing Turbine Overspeed Trip

Servicing and adjustment of overspeed trip requires a repetitive process of isolating the trip valve, adjustment, placing the turbine back in service, testing, re-isolating, and repeating the process as many times as necessary to set the required trip speed.

The turbine and driven equipment are fully locked out/ tagged out prior to physical contact with rotating elements of the equipment. The driven piece of equipment remains locked and tagged out throughout the turbine overspeed trip test.

When work is performed on steam supply systems greater than 150 lbs., (including branch lines), the system must be depressured and isolated by double block and bleed method.

Once all repair work on the turbine is complete the following requirements must be met:

1. Operations is available and on job site during overspeed trip test.

2. The turbine isolation valves (supply & exhaust) are opened and closed by operations.
3. The turbine coupling guard must be installed whenever the turbine is running.
4. After the overspeed trip is set, applicable LOTO controls must be reapplied to the turbine by Operations prior to installing the coupling and completing the job.

1.8 Low Hazard Utility System Repairs or Modifications

For low-pressure small, diameter steam line isolations such as steam tracing, minor manifold modifications or upgrade to meet Refinery standards then, *single block valve isolation is an acceptable alternative* if **all** of the following conditions are met:

1. It is impractical to blind due to the lack of flanges, or the total hazard associated with blinding is greater than not blinding.
2. Double block and bleed is not possible without interrupting service or isolating large portions of the distribution system.
3. Design operating pressure is 150 psi or less.
4. Line size at isolation valve is 3 inches or less.
5. Site access allows the worker to readily move to a safe location and the work is not confined space entry.
6. Block valve isolation is confirmed. If there is leak by, then Operations and Maintenance evaluate the leak, perform HSE and determine if the job can be done safely.
7. If possible, the isolation valve must be “locked” in the closed position using a lock and chain or self-locking 50# break strength attachment.

Single block isolation is an acceptable alternative in low hazard water and air systems such as firewater, drinking water, fresh water, reclaimed water, DWOP water, effluent water, yard air, and instrument air. Single block isolation is acceptable, in these cases, when **all** the following conditions are met:

1. Double block and bleed is not possible without interrupting service or isolating large portions of the distribution system.
2. Line operating pressure is 300 psig or less.

3. Line operating temperature is under 100°F.
4. Site access allows the worker to readily move to a safe location and the work is not confined space entry.
5. Block valve isolation is confirmed. If there is leak by, then Operations and Maintenance evaluate the leak, perform HSE and determine if the job can be done safely.

1.9 Storm/Process Water Line Repairs - Low Pressure/No Block Valves

An acceptable alternative for isolating storm or process water sewers without block valves is to use balloons as the primary isolation in order to make the repairs. A combination of two balloons or one balloon and one seal plate are used (similar to a double block and bleed isolation). The use of a single balloon requires a variance. Balloons are used only when the following is ensured:

1. Balloon type matches service (i.e., temperature rating).
2. Balloon is maintained at or above minimum air pressure.
3. Balloon achieves a tight seal (no leaks) unless other means to control leaking (i.e., pump) is employed.
4. Pumps are used to prevent buildup of pressure upstream of the balloon. A standby pump is on-site.

1.10 SRU Interconnected Equipment Isolation/No Flanges

1. Prior to entry, SRU Trains are shut down, depressured, cleaned up, and isolated.
2. Balloons are an acceptable method of isolation of inter-connected equipment in the SRU Trains due to line size and lack of flanges.
3. Demister pads may be removed without SCBA equipment when boundary blinds are installed and double block & bleed for isolation is provided. Atmosphere check for H₂S, SO₂, and LEL must be within acceptable ranges.

1.11 SRU Special Isolation of R-2600 and R-2800

Due to the inaccessibility of flanges at the vessel, the overhead line from R-2600 and R-2800 in the SRU's is isolated with blinds at the inlets of C-2608 and then C-2808.

1.12 Off Plot Piping Systems

Refinery plants are interconnected with a complex system of off-plot piping.

When a system services more than one plant or operating area and it must be isolated for maintenance, the operating area initiating the work coordinates system isolation and initiates lock out/ tag out.

1. The initiating area is responsible for managing the isolation locks and lock box.
2. Plants affected by the initiating area isolation install yellow operations locks and “Danger” tags at the shared isolation point.
3. Affected areas receive a copy of isolation list with the affected plants’ isolation points identified.
4. The initiating area is responsible for coordinating return to service with affected plants.

1.13 Tightening Tubing and Flange Leaks

Tightening tubing or flange leaks does not require opening equipment but may be hazardous to the mechanic or others if the leak gets worse.

Tubing leaks, screwed fittings, or flanges on higher pressure or highly hazardous systems (H₂, flash < 100 degrees F, sour gas and, acid) require the system be isolated and depressured prior to tightening the fittings.

1. Tightening tubing leaks or screwed fittings on lower pressure or non-hazardous systems the operator and mechanic perform a JHA/JJSV and discuss the potential risks associated with increased leakage or separation of the fitting and determines if the system must be isolated prior to proceeding with the work.
2. Tightening flange leaks the operator and mechanic perform a JHA/JJSV and discuss the potential risks associated with increased leakage and determines if the system must be isolated prior to proceeding with the work.
3. If the system must be isolated, LOTO procedures apply.

1.14 Short Duration Work

Removal or replacement of control valves, level displacers or floats, gage glasses, orifice plates and pressure relief valves can be done using the single block isolation method if the work is continuous and the replacement part or boilermaker flange is installed immediately on any open piping.

1. The work should be completed within a single shift.
2. The job should never be left open and unattended.
3. Installation of blinds is considered short duration work.

1.15 Blinding Pressure Relief Devices (PRD) Process system side only (non-relief)

PRD's are not considered an isolation device. If no upstream or downstream isolation block valves exist then PRD systems and piping are blinded using the following steps and meeting the following conditions:

1. Verify system is non-hazardous and system pressure is at 0 psi.
2. Locate bleeder closest to blind installation point and use that location to verify hazardous conditions.
3. If you are unable to verify the hazardous conditions at the blind installation point then mechanics must don fresh air before spreading flange.
4. After flange is OPEN - gas test equipment and verify non-hazardous conditions (or acceptable limits -depending on service of equipment).
5. If gas test verifies non-hazardous conditions (acceptable limits) then mechanics can discontinue use of fresh air.
6. If gas test verifies hazardous conditions (unacceptable limits) then mechanics continue blind installation using fresh air.
7. Repeat steps 1 thru 6 to remove blinds.

1.16 Equipment rotation check and shaft installation 480v and below

The Operator is responsible for ensuring all personnel are clear of hazards which might result from the equipment being energized/de-energized.

If rotation of equipment is questionable, i.e., motor leads replaced, new motor, proceed as follows:

1. Electrician reconnects leads at motor starter.
2. Operator and Electrician verify rotation is correct
3. Once rotation is verified as correct Electrician identifies and marks each phase of the motor leads and disconnects.
4. Operator and Electrician will verify at start/stop station that equipment does not start.
5. Once verified mechanics install shaft with motor leads disconnected.

1.17 Craft Lock Removal – LOTO Job NOT Complete – N₂ Test Needed

Sometimes conditions call for N₂ testing. Most frequently this occurs while working on compressors to verify the chamber is not leaking. The LOTO is in place but only specific LOTO items need to be removed in order to complete the N₂ test.

When N₂ testing is needed the Maintenance Supervisor and Craft Representative must complete the following:

Maintenance Supervisor does the following

1. Determines which craft locks are removed.
2. Gives work direction to craft representatives by identifying specific craft locks.

Craft Representative does the following:

1. Removes locks specified by Maintenance Supervisor.
2. Completed N₂ Testing.
3. Upon completion of N₂ Testing, craft locks are replaced.

Appendix D: Electrical Isolation - Specifics

1.0 Electrician Responsibilities

The electrician performs an electrical “Lockout/Tagout” with the operator at the jobsite to electrically isolate operating equipment for mechanical or electrical work.

The Electrician performs the following:

1. Reviews the job with the responsible operator, tags the START/STOP station with a red “Danger” tag (GO-1492), and then electrically “air gap” the circuits.
2. Air gapped circuit: disconnected motor leads at the starter, fuses pulled, opening knife blades, or the breaker is racked out of its cell.
3. Electrical isolation is performed before a red “Danger” tag and craft lock are hung with the operator’s tag and green isolation lock on the outside of the cabinet.
4. A red “Danger” tag and lock is never attached to a cabinet if a breaker is turned off without the circuit being air gapped.
5. The electrician accompanies the operator to the “lockbox” located at the job site and witnesses the key to the green isolation lock being deposited in the lockbox.
6. The box is locked using the operator’s lock and tag and the electrician’s craft lock and tag.
7. Motor leads are disconnected at the starter and taped separately being positioned away from their connection points.
8. The electrical leads are properly marked to ensure proper rotation of the motor when reconnected at the conclusion of the work.
9. When fuses are pulled, the electrician either hangs a separate red “Danger” tag at the point of removal or notes its removal on the main red “Danger” tag on the outside of the cabinet.
10. The electrician notes other locations where the circuit is altered on the red “Danger” tag.
11. Verifies the electrical point of isolation involving opening knife blade disconnects or performing a breaker rack out. The responsible operator attaches an isolation lock and tag then the electrician attaches a craft lock and tag to a lockout clip on the disconnect equipment.
12. Installs lockout clip to prevent the switch from being closed or the breaker from being racked in.

13. If performing electrical work beyond initial electrical “Lockout/Tagout” the electrician’s personal lock and tag is attached to the lockbox, along with an electrical craft lock and tag.

Motor Removal

For purpose of motor removal do the following:

1. Follow the “electrical Lockout/Tagout” procedure described above.
2. Disconnect motor leads in the motor junction box.
3. Mark lead appropriately.
4. Tape leads coming from the starter.
5. Disconnect conduit from junction box.
6. Position the disconnected conduit so water (rain) does not enter the conduit.
7. Tape plastic around the leads to protect against moisture or rain.

Conveyors, elevators, cooling tower fans, air-cooled exchanger fans, or in vessels equipped with mixers

Before starting mechanical work on conveyors, elevators, cooling tower fans, air-cooled exchanger fans, or in vessels equipped with mixers, an “electrical Lockout/Tagout” is performed.

Motor leads are disconnected and visually exposed at one of two locations:

1. At the motor junction box
2. A place where mechanics and operators on these jobs can visually see and verify the physical disconnect

Appendix E: Turnarounds

(Includes Isolation/Blind List and JHA/JJSV for Shutdowns Only)

- 1.0 Each Division is assigned a Turnaround Core Team. The Core Team will determine when maintenance activity qualifies as turnaround work. Generally, when an operating facility, plant or large system shuts down for maintenance activity, that facility, plant or large system is considered to be in a turnaround mode. Core Teams are responsible for developing an isolation plan and communicating the plan for each event.
- 2.0 A turnaround work scope is an assembly of multiple work orders requiring a plant shutdown for execution. The Shutdown Check List, the Inspection Work List, the Operations Work List, Instrument and Electrical Reliability work lists, Maximo Work Orders, extra work orders, or specific Engineering Work Orders will suffice as a “work order” for LOTO purposes. Release of work on shutdowns usually occurs through the use of permits such as the 5-part Blind Tag, 5-part Valve Tag, RI-341 Ignition Source and General Work Permits, or the High Temperature Environment Work Permit. For the release of work not identified through the use of these permits, Operations will sign a “work order” on the date of work release. No undocumented work will be released by Operations.
- 3.0 **PLANT PLOT LIMIT or MAJOR SYSTEM ISOLATION:** When the entire Plot Limit or when a portion of the plot limit specific to work scope is isolated for plant turnarounds, the following procedure may be implemented in lieu of the standard LOTO process. These procedures may also be used for large systems within a plant if the system is completely isolated from other plant piping.
 - 3.1 Once Operations has closed each isolation valve, chained, and locked them with green isolation locks and tagged the plot limit as required per the S/D work scope, the Operator will place these Isolation Lock keys into the plot limit lock box. Operations will attach a Yellow Operations Craft Lock with a Yellow Operations Danger Do Not Operate Tag to the lock box. Once the Operator has demonstrated his/her isolation to a Company/Contract Mechanical work group, the mechanical work group will designate a representative to attach his/her personal locks and craft Danger tags to the plot limit or system lock box(es) for the duration of the assigned work scope. Craft crewmembers will not be required to attach their personal locks to the plot limit lock boxes. There may be one or multiple lock boxes, one for each system, assigned to the plot limit at the discretion of Operations.
 - 3.2 The Lock Box, Isolation Locks, Craft Locks, and individual personal locks will not be required for internal plant stationary equipment if the associated plot limit or system piping has been isolated, locked out, and tagged out by Operations and the Crafts as described in 3.1 above. For entry into a confined space, refer to [RI-9920](#).

- 3.3 For pipelines or systems not isolated as noted in 3.1 and 3.2 above, the full text of [RI-9900](#) applies except as noted in Sections 4 through 11 below.
- 4.0 **PLANT ELECTRICAL EQUIPMENT:** The Operator and/or Electrician will perform a standard electrical Lockout/Tag out for all electrical equipment identified in the shutdown work scope. Refer to main text and relevant appendices for electrical LOTO procedures.
- 5.0 **SMALL SYSTEM ISOLATION:** Operations and Maintenance may LOTO using a multi-hole lock clip without the use of a lock box, at the discretion of Operations. Operations will isolate block valves, chain the hand wheel using a multi-hole lockout clip, then attach a yellow Operations craft lock with a yellow Operations danger tag to the clip. Once the Operator has demonstrated their isolation to a Company/Contract Mechanical work group, the mechanical work group will designate a representative to attach his/her personal locks and craft danger tags to each lock out clip for the duration of the assigned work scope. Craft crew members will not be required to attach their individual personal locks to the lock out clip.
- 6.0 **PLANT FIXED EQUIPMENT:** Operations will install blind tags at all plot limit and in-plant blinding locations and follow standard equipment tagging procedures. In addition to the Operations tags, Maintenance will install their respective craft tags at all in-plant points of isolation respective to their work scope.
- 7.0 **ISOLATION LISTS:** Isolations lists will not be required. The use of blind tags for blinding is always required. All blind locations for boundary isolations or specific equipment isolations will be identified, issued, and tracked by Operations with an “Equipment Blind List” or “Boundary Blind List.” Double block and bleed configurations, tubing, and pipe union disconnects used for isolation will be included on blind lists.
- 8.0 **MCC:** At the motor control centers for plants in a shutdown mode, properly trained and equipped personnel will turn all out of service plant equipment electrical disconnects to the off position and tag out. The exception may be non-rotating equipment such as plant lights or utility power. For equipment included in the shutdown work scope, refer to Section 4.
- 9.0 **SINGLE BLIND, MULTIPLE BLIND TAG LOCATIONS:** When one blind or one double block/bleed is intended to serve as isolation for multiple jobs, a separate blind tag shall be placed representing each job or blind list.
- 10.0 **TEMPORARY PUMP OUT HEADERS:** Will be fabricated, hydrotested, and installed per engineering specifications. The connection of these temporary systems to the plant equipment is subject to Operations and Mechanic tag out procedures only.
- 11.0 **JJSV/JHA DOCUMENTATION:** On turnarounds, Maintenance and Operations will field verify LOTO for fixed equipment using the shutdown “Chevron Job Hazard

Analysis Form” for shutdowns. Field verification of LOTO will be performed for each job on the work scope list and whenever special hazards are a concern as determined by the Turnaround Core Team. Examples of special hazards are red oil or arsenic service, engineered crane lifts in an operating plant, etc. Specifically, the JJSV form is initiated by Maintenance and performed jointly with Operations in the field when Maintenance activity is performed prior to the full release of fixed equipment. Examples of when a JJSV is required are when blinding, hot bolting, or connecting temporary piping or hose to an operating plant. When fixed equipment is fully released, Maintenance will initiate the JHA form used by Maintenance personnel on a shift by shift basis for the duration of the work scope including hydrotesting activity. When Maintenance is mechanically complete and is called by Operations to remove isolation blinds, Maintenance will again initiate the JJSV form, performed jointly with Operations in the field.

Contract companies may use their JHA, (Job Hazard Analysis), forms for LOTO verification and other safety concerns when approved by the Shutdown Core Team. Maintenance will originate forms and the Core Teams will manage them.

NOTE: When a Designated Representative (DR) attaches personal locks in lieu of each mechanic attaching a personal lock:

- Each mechanic must know who the DR is in case of questions regarding the status of LOTO for the job.
- The DR must be aware of the exposure status of each individual working the job, and alert each individual and ensure it is safe prior to removing the personal lock.

[Click here](#) to view the Job Analysis Form for Shutdowns Only

CHEVRON JOB HAZARD ANALYSIS FORM - For SHUTDOWNS ONLY

NOTE: This form is to be brought to the work site by the first representative of each craft.

DATE:	JOB NO.:	LOCATION:
MAINT. SUPERVISOR:	PHONE NO.:	
OPERATOR:	PHONE NO.:	
<u>MECHANIC'S NAME</u>	<u>CRAFT</u>	<u>COMPANY</u>

JOINT JOB SITE VISIT (JJSV) – Operator/Mechanic Discussion	Completed? -->	Yes	N/A
Blind List: Review list, operator points out all isolation and depressurization points.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrical Isolation Verification: Electrician craft lock on lockbox, test start/stop switch.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LOTO Process in Use (check one): <input type="checkbox"/> Major System <input type="checkbox"/> Lockbox <input type="checkbox"/> Common Clip	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Locks and Tags Installed: Confirm that all locks and tags are installed per RI-9900.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional Work Permits reviewed and signed—check those that apply: <input type="checkbox"/> Ignition Source <input type="checkbox"/> High Heat <input type="checkbox"/> Fresh Air <input type="checkbox"/> General Work <input type="checkbox"/> Excavation <input type="checkbox"/> Confined Space <input type="checkbox"/> Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous Materials: Material: _____ MSDS No.: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal Protective Equipment reviewed—check those that apply: <input type="checkbox"/> Respirator <input type="checkbox"/> Hearing Protection <input type="checkbox"/> Goggles <input type="checkbox"/> Faceshield <input type="checkbox"/> Chemical Suit <input type="checkbox"/> Chemical Gloves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety Equipment identified: Eyewash/Safety Shower, Fire Equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nearby Jobs That Pose Additional Hazards reviewed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous Nonroutine Maintenance: (i.e., in-plant hot work, hot taps, leak seals, live relief, Scott Air). Discuss what could go wrong. Consider alternative solutions. Consider raising the approval level. Confirm that it is safe to proceed.	<input type="checkbox"/> Yes <input type="checkbox"/> No		

JOB HAZARD ANALYSIS (JHA) – Mechanical Craft discussions below. Also review JJSV items above.			
General Questions	Yes	No	N/A
Evacuation assembly area known?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency action plan reviewed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fall Protection required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MSDS's Reviewed with crew/on-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Barricade tape/fence/shield?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAFETY REMINDERS – Review these items before starting work.	
Safety behaviors discussed	Pinch points/line of fire
Basic PPE: Head/Eye/FR clothing/gloves/footwear	Flying particles/sharp objects/hot surfaces
Proper tools and equip./use/condition	Permissible Exposure Limits
Flammables properly stored	Inert atmospheres/surroundings
Slipping/tripping hazards	Critical lift plan
COMMENTS from above JJSV and JHA reviews:	

[Click here](#) to obtain the electronic copy of the Isolation List

[illegible]

Appendix F: Deviation Request Form

- 1.0 The RI-9900 Deviation Request Form is to be used for Single Block Isolations of equipment if an approved written procedure does not already exist in this Instruction.

The concerns of all involved personnel are discussed and addressed prior to approval of the Deviation Request. The completed form explains why the deviation is necessary.

If an approver is unavailable, authority for authorizing the change is delegated to the approver's supervisor or management representative.

For emergency work that occurs on off-shifts or weekends, the RSL may solicit approval of the management representatives by telephone.

- 2.0 A copy of the completed form is:
- Maintained at the jobsite with the JJSV/JHA form.
 - Retained in the ABU PSM files.
 - Sent to the Safety Team Leader.

[Click here](#) to obtain the electronic copy of the Deviation Request form.

DEVIATION REQUEST FORM	
INSTRUCTIONS: This form must be completed and posted with the JJSW/JHA form at the work site. The form is to be initiated by the operator who completes the job "Isolation List" and then forwarded for approval. One copy of this form is to be retained in the RBU PSM file and a second forwarded to the Refinery Safety Team Lead.	
RBU:	Plant: Equipment or Work No.:
Proposed Deviation (explain normal versus deviation):	
<div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>	
Justification for Deviation (if necessary, use reverse side):	
<div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>	
Time Period for Deviation:	Job Duration Other:
Approval Signatures:	
	Date: Head Operator
	Date: Maintenance Supervisor
	Date: Refinery Business Manager
	Date: Maintenance Manager (Operations Manager, Refinery Manager, or Management On-Call may sign for RBM or Maintenance Manager in his or her absence.)
MS FrontPage/referenceref_inst/RI-New/ri-9900/9900forms/app11-deviation.docx	
10/15/03	

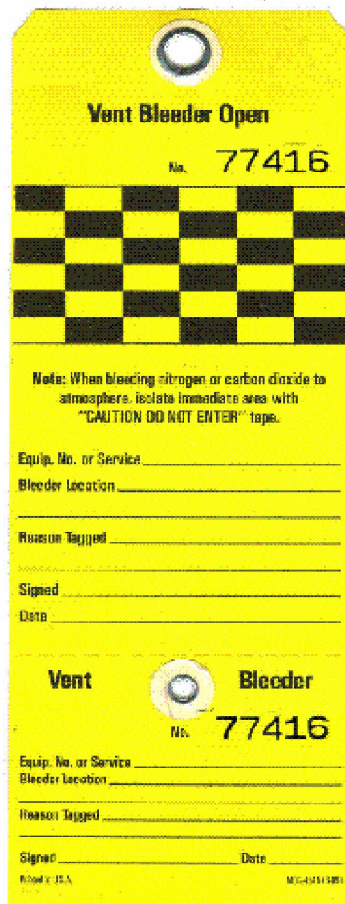
Appendix G: Tags and Locks



YELLOW OPERATOR'S DANGER TAG (GO-1493)

1. The yellow “Danger” tag is used by operators to identify any controlling part of equipment when it has been necessary to close, open, or adjust to depressure, deactivate, or de-energize the equipment. Operating personnel must hang this tag on any control such as process valves, electrical controls, remote controls, etc., to indicate that the controls are not to be changed in position.
2. When used in conjunction with either/or the red electrician’s “Danger” tag, blue mechanic’s “Danger” tag, or blue/orange machinist’s tag, it is to be installed first and removed last, and then only by a responsible area operator or the assigned safety operator.
3. The yellow operator lock will be used when locking a lockbox. The yellow operator lock may also be used when a valve(s), switch, or control will be isolated for an extended period of time and is not being used for release of operating equipment.

VENT BLEEDER TAG (MFG-4515)



The image shows a yellow Vent Bleeder Tag (MFG-4515) with a hole at the top. The tag is divided into two identical sections. The top section is titled "Vent Bleeder Open" and contains the number "77416". Below this is a black and white checkered pattern. A note states: "Note: When blowing nitrogen or carbon dioxide to atmosphere, isolate immediate area with 'CAUTION DO NOT ENTER' tape." Below the note are fields for "Equip. No. or Service", "Bleeder Location", "Reason Tagged", "Signed", and "Date". The bottom section is titled "Vent" and "Bleeder" and contains the number "77416". Below this are fields for "Equip. No. or Service", "Bleeder Location", "Reason Tagged", "Signed", and "Date". At the bottom left, it says "Revised: 2010" and at the bottom right, it says "MFG-4515 (01/10)".

Vent Bleeder Open
No. 77416

Note: When blowing nitrogen or carbon dioxide to atmosphere, isolate immediate area with "CAUTION DO NOT ENTER" tape.

Equip. No. or Service _____
Bleeder Location _____
Reason Tagged _____
Signed _____
Date _____

Vent Bleeder
No. 77416

Equip. No. or Service _____
Bleeder Location _____
Reason Tagged _____
Signed _____ Date _____

Revised: 2010 MFG-4515 (01/10)

1. The operator fills out all the information on the tag and places on vents and bleeders of individual equipment.

NOTE: This tag is available in both one- and two-part versions.

BLUE MECHANICS DANGER TAG (GO-1494)



1. The blue “Danger” tag is to be attached to or removed from locks and lockboxes by mechanics as follows:
 - a. Before work is started to indicate that mechanics will be making repairs to the equipment.
 - b. Will be attached to all personal and craft locks prior to attaching to lockbox.
2. By placing their personal lock on a lockbox, the mechanic is confirming that they have verified the isolation of the equipment and that it is safe to proceed.
3. Craft locks and tags will be installed by the first craft person on the job and will be removed by the craft person that completes the job.
4. Personal locks and tags will be installed prior to commencing work and will be removed anytime the individual leaves the jobsite (excluding breaks and lunch).

BLUE/ORANGE MACHINIST DANGER TAG (GO-1570)



1. The blue/orange “Danger” tag is to be attached to or removed from locks and lockboxes by machinist as follows:
 - a. Before work is started to indicate that machinist will be making repairs to the equipment.
 - b. Will be attached to all personal and craft locks prior to attaching to lockbox.
2. By placing their personal lock on a lockbox, the mechanic is confirming that they have verified the isolation of the equipment and that it is safe to proceed.
3. Craft locks and tags will be installed by the first craft person on the job and will be removed by the craft person that completes the job.
4. Personal locks and tags will be installed prior to commencing work and will be removed anytime the individual leaves the jobsite (excluding breaks and lunch).

RED ELECTRICIAN DANGER TAG (GO-1492)



1. The red “Danger” tag is used by electricians. It indicates that a particular piece of electrical equipment has been electrically isolated.
2. The red “Danger” tag will normally be placed on controls after the yellow “Danger” tag is attached by an operator.
3. Will be attached to all craft locks prior to attaching to electrical breakers and to personal/craft locks prior to attaching to lockboxes.
4. By placing their personal lock on a lockbox, the electrician is confirming that they have verified the isolation of the equipment and that it is safe to proceed.
5. Personal locks and tags will be installed prior to commencing work and will be removed anytime the individual leaves the jobsite (excluding breaks and lunch).

GRAY INSTRUMENT MECHANIC TAG (GO-1705)



1. The gray “Danger” tag is to be attached to or removed from locks and lockboxes by instrument mechanics as follows:
 - a. Before work is started to indicate that instrument mechanic will be making repairs to the equipment.
 - b. Will be attached to all personal and craft locks prior to attaching to lockbox.
2. By placing their personal lock on a lockbox, the mechanic is confirming that they have verified the isolation of the equipment and that it is safe to proceed.
3. Craft locks and tags will be installed by the first craft person on the job and will be removed by the craft person that completes the job.
4. Personal locks and tags will be installed prior to commencing work and will be removed anytime the individual leaves the jobsite (excluding breaks and lunch).

RED/WHITE UTILITY (GO-1495)



1. This tag is used by the Utilities Section to control switchgear, steam, water, gas systems, etc.

MULTI-SECTION BLIND TAG (GO-1497)

62309

CAUTION DO NOT REMOVE THIS TAG

OPERATOR CHECK LIST
☐ BLIND OUT ☐ GASKET JOINT FITTED ☐ HAMMER TESTED
☐ SYSTEM VENTS BLEEDERS CLOSED AND BULL PLUGGED
 SIGNED: _____

CAUTION **62309 A**
BLIND TAG
 MECHANIC – GIVE THIS SECTION A TO OPERATOR AFTER BLIND IS REMOVED. FLANGES TIGHTENED

SERVICE _____
 LOCATION _____
 MECHANIC'S NAME _____ DATE _____
 TYPE: ☐ WHEEL ☐ FLEX ☐ TAG ☐ ORJ
 RATING _____
 MAT'L _____

DANGER **62309 B**
BLIND TAG DO NOT REMOVE BLIND UNTIL THIS RED SECTION B IS REMOVED BY OPERATOR

BLIND TAG **62309 C**
 MECHANIC – GIVE SECTION C TO OPERATOR WHEN BLIND INSTALLED

MECHANIC'S NAME _____ DATE _____
 SERVICE _____
 LOCATION _____ SIZE _____
 TYPE: ☐ WHEEL ☐ FLEX ☐ TAG ☐ ORJ
 RATING _____
 MAT'L _____

DANGER **62309 D**
BLIND TAG DO NOT INSTALL BLIND UNTIL THIS RED SECTION D IS REMOVED BY OPERATOR

BLIND TAG **62309 E**
 OPERATOR'S COPY

SERVICE _____
 LOCATION _____
 SIZE _____ DATE _____ SIGNED _____

REVISED
 8/10/00

1. Safety Operator or assigned operator attaches blind tag to flange to be blinded, signs and removes **E** Stub for his/her files, and enters tag number on isolation list.
2. In presence of mechanic, Safety Operator or assigned operator removes **D** Stub.
3. When blind is installed, mechanic dates and initials **C** Stub and gives to Safety Operator or assigned operator.
4. Safety Operator or assigned operator removes **B** Stub when blind is to be pulled.
5. When blind is removed, mechanic signs **A** Stub and gives to Safety Operator or assigned operator.
6. After blinding is completed, the operator will remove the yellow/white top section and complete operator checklist requirements.

MULTI-SECTION TAG - RELIEF VALVE TAG (GO-1496)

Relief Valve Tag 11319 A
Mechanic's Initial _____ Date _____
Service _____ Location _____
Do Not Install Relief Valve Until This Red Section Removed By Operator 11319 B
Caution Relief Valve Tag
Relief Valve Tag 11319 C
Mechanic's Initial _____ Date _____
Service _____ Location _____
Do Not Remove Relief Valve Until This Red Section Removed By Operator 11319 D
Caution Relief Valve Tag
Relief Valve Tag 11319 E
Operator's Copy
Service _____ Location _____
Size _____ Date _____ Signed _____

1. After attaching relief valve tag, Safety Operator or assigned operator signs and removes **E** Stub for his files, and enters tag number on relief valve list.
2. When conditions are safe, Safety Operator or assigned operator removes **D** Stub.
3. When relief valve is removed, mechanic dates and initials **C** Stub and gives to Safety Operator or assigned operator.
4. Safety Operator or assigned operator removes **B** Stub when relief valve is ready for installation.
5. When relief valve is installed, mechanic signs **A** Stub and gives to Safety Operator or assigned operator.

MULTI-SECTION VALVE REPAIR TAG (GO-1496-BL)

PLANT	EQUIPMENT	TAG #	Section
			A
Type Valve List: _____ Valve Type: _____			
Valve Location: _____			
Work Requisition Section (Tie to Valve)			
1 Repack Valve 2 Freeup Valve 3 Repair Bonnet Leak 4 Repair Flange Leak			
5 Replace Valve 6 Open/Inspect 7 Valve Leaks By 8 Remove From Service			
9 Other _____ Repair Code <input type="checkbox"/>			
Installed: Mechanic _____ Date _____			
			B
Type Valve List: _____			
Valve Type: _____			
Work Release Section (File in Control Room)			
DANGER Do Not Install This Valve Until This Red Section Removed By Operator			
			C
Type Valve List: _____ Valve Type: _____			
When Work Completed: Mechanic, Notify Operator			
<input type="checkbox"/> Repacked <input type="checkbox"/> Bonnet Gasket Replaced <input type="checkbox"/> Inspected Internally <input type="checkbox"/> New Valve Installed <input type="checkbox"/> Field Overhauled <input type="checkbox"/> Grease Grooves Cleaned <input type="checkbox"/> Seats & Wedge Ground <input type="checkbox"/> Other _____			
Repair Completed: Mechanic _____ Date _____			
			D
Type Valve List: _____			
Valve Type: _____			
Work Release Section (File in Control Room)			
DANGER Do Not Work On Or Remove This Valve Until This Red Section Removed By Operator			
			E
Type Valve List: _____			
Valve Type: _____			
Valve Location: _____			
Operator Record Section (File in Control Room)			
Valve Service: _____ Valve Size: _____			
OPS INIT: _____ Date: _____			

GO-1496-BL (9-96)

1. After attaching tag, Safety Operator or assigned operator fills in, signs and removes **E** Stub, and files it in the control room.
2. When it is safe to do so, the Safety Operator or assigned operator removes the **D** Stub.
3. When job is completed, mechanic dates and initials **C** Stub and gives to Safety Operator or assigned operator.
4. Safety Operator or assigned operator removes **B** Stub when ready for installation.
5. When installed, mechanic signs **A** Stub and gives to Safety Operator or assigned operator.

Appendix H: RI-9900 – Audit Form

[Click here](#) to view the electronic version of the Audit Form.

RI-9900, APPENDIX H - AUDIT FORM

Plant/Location _____	Date _____
Equipment _____	Job ID (Passport #) _____
Routine _____ or Turnaround _____	
Names of Auditors _____	
Housekeeping Comments: _____	
Equipment Service (acid, gasoline, sour gas, steam, etc.) _____	
MSDS# from JJSV _____	
ANY NO RESPONSE TO THE QUESTIONS BELOW REQUIRES A COMMENT	
1. Was Isolation List available and accurate for current conditions?	Yes <input type="checkbox"/> No <input type="checkbox"/>
2. Are all Isolation, Operator, Craft, and Personal locks properly installed?	<input type="checkbox"/> <input type="checkbox"/>
3. Are all tags properly filled out and attached?	<input type="checkbox"/> <input type="checkbox"/>
4. Did employees on-site participate in a JJSV?	<input type="checkbox"/> <input type="checkbox"/>
5. Was a JHA for each craft performed?	<input type="checkbox"/> <input type="checkbox"/>
6. Are on-site employees aware of current hazardous conditions?	<input type="checkbox"/> <input type="checkbox"/>
7. Was proper PPE used?	<input type="checkbox"/> <input type="checkbox"/>
8. Did each person interviewed in the audit demonstrate a clear understanding of the LOTO process? (See reverse for sample interview questions)	<input type="checkbox"/> <input type="checkbox"/>
Comments: (indicate by question number) Maintenance or Operations? _____ _____ _____ _____ _____ _____ _____ _____ Type or write additional comments on another sheet.	
List names of people involved in this LOTO job	
Name _____	Craft _____ Company _____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
Lead Auditor signature _____	Phone number _____
Copies of this audit have been distributed to the following: Local Shift Team Leader _____ (name) _____ Local Maintenance Supervisor (name) _____ Safety Team Lead (name) _____	

Appendix I: Special Procedures Involving Electrical Switch Cards

- 1.0 This appendix covers the general procedures for releasing utilities electrical equipment to Maintenance. For detailed description see R-4050 “Operation of Electrical Distribution System” or [RI-389 Electrical Safe Work Practices](#).

The Utilities Distribution Head Operator (DHO) is responsible for ensuring all personnel are clear of hazards which might result from the equipment being energized/de-energized.

- 2.0 Electrical disconnects controlling equipment under the jurisdiction of the Utilities Section is operated by the following:

- 2.1 Electrical Distribution Coordinator
- 2.2 Electrical Operating Assistant
- 2.3 Electrically qualified Utilities Section Shift Team Leaders
- 2.4 Electrically qualified Utilities Operators
- 2.5 Other Electrically Qualified Personnel, authorized by the Electrical Distribution Coordinator, Electrical Operating Assistant, or Utilities Section Shift Team Leaders.

- 1. Example: During a power outage personnel with previous experience in Utilities may be called to assist with restoration activities or an electrician working in the field may need to open a breaker to prevent loss of life or damage to equipment.

Two or more electrically qualified persons working together should perform switching activities. The only exception to this is in emergency situations when there is immediate danger to life, health, or equipment.

Electrical disconnects controlling No. 1 Power Plant and Cogen equipment is operated by assigned operators.

When mechanical work is on equipment that moves or rotates RI-9900 "Electrical Lockout/Tagout" is performed ([Electrical Isolation Specifics](#) – Appendix D, Section 1.0).

- 3.0 The Electrical Supervisor or designated Electrician, who is familiar with the Utilities electrical distribution system, accompanies and observes or reviews the switching operation with Utilities personnel.

- 3.1 The Utilities Operators attaches green isolation locks at the isolation points with a Utilities red and white “Danger” tag attached to the locks.

- 3.2 The Electrician or Electrical Supervisor attaches a red electrical craft lock with electrical red “Danger” tag attached to the locks at the same locations.
- 3.3 The Utilities Operator and Electrician proceed to the lockbox located at the job site and the Utilities Operator deposits the isolation lock keys in the lockbox.
- 3.4 The Utilities Operator attaches a Utilities operator lock on the lockbox with the Utilities tag attached to the lock.
- 3.5 The Electrician attaches a red electrician’s craft lock and their personal lock, with red “Danger” tags attached to both, on the lockbox.
- 4.0 The Electrical Supervisor or Electrician confirms that isolation points, energized hazards, possible feed backs, and energized equipment within the work boundaries are completely understood and signs the switch card in the acceptance section located at the bottom of the card.

The Utilities personnel in charge of switching do not release the switch card without witnessing the acknowledgment signature.
- 5.0 The designated Electrician reviews the switch card with the work crew prior to performing work to ensure the crew understands the scope of the work, job boundaries covered by the switch card, points of isolation, and any special considerations.
- 6.0 Upon completion of the work, the Electrical Supervisor or Electrician, familiar with the work performed, signs the switch card in two places:
 - 6.1 The first signature is that all Electricians Reported off the line
 - 6.2 The second signature is that the work is complete and ready to energize.

Appendix J: Working on Live Relief Systems

1.0 PURPOSE

- 1.1 This procedure covers the opening of live relief systems for maintenance work. It will be used throughout the Refinery to minimize environmental impact and to ensure safety of those doing the work.
- 1.2 The intent of this policy is to minimize live relief work due to the increased risk involved in working on a system that is not completely isolated from hazardous energy. Live relief work involves opening of a relief system downstream of pressure relief or other devices that have not been physically disconnected, blinded, or blocked and locked.
- 1.3 All alternatives must be explored prior to initiating the live relief work process.

2.0 SAFETY PRECAUTIONS

- 2.1 Use of Fresh Air Equipment is mandatory. Follow requirements of [RI-338](#) to obtain a Fresh Air Permit.
- 2.2 Adequate fire-fighting equipment must be on site and verified as ready for immediate use.
- 2.3 Use correct PPE based on equipment service. Refer to [RI-314](#) for protective clothing requirements. An HSE will be held to determine any special PPE requirements.
- 2.4 Hang “DANGER” tape to warn people to stay out of the immediate area.
- 2.5 A dedicated Safety Operator is required. A separate Fire Watch may also be required if the Safety Operator cannot fulfill this duty.
- 2.6 If the work is done at height, two egress paths must be provided. (Refer to [RI-380](#).)

3.0 REFERENCES

- 3.1 [RI-314](#) “Protective Clothing and Safety Equipment”
- 3.2 [RI-338](#) “Respiratory Protective Equipment”
- 3.3 [RI-341](#) “Hot Work and General Work Permits”
- 3.4 RI-9900 “Control of Hazardous Energy (LOTO)”
- 3.5 [RI-380](#) “Fall Protection”

4.0 PREREQUISITES

- 4.1 Obtain historical relief gas header sample results. Plan PPE and other precautions around expected worst case. Results should also be discussed as part of the HSE.
- 4.2 Conduct an HSE meeting using the Live Relief Work HSE form. Forward this documentation along with the Live Relief Work Permit for approval.

5.0 RESPONSIBILITIES

- 5.1 Maintenance will initiate the Live Relief Work Permit. This will include a review with Operations on the need for the work, and why it cannot be accomplished during a shutdown window or without otherwise isolating the system.
- 5.2 The Shift Team Leader and Maintenance Supervisor will review the job in the field prior to conducting the HSE and agreeing to proceed with the work.
- 5.3 The Shift Team Leader will ensure that an HSE is performed and documented using the HSE form.
- 5.4 The Shift Team Leader will approve the permit and forward the permit and HSE documentation to the Refinery Business Manager for review.
- 5.5 The Refinery Business Manager will review and approve the package, then obtain the approvals of the Refinery Assets and Maintenance managers before proceeding.
- 5.6 The Operations and Maintenance managers will review the package. When the package is approved, it will be routed back to the Refinery Business Manager.
- 5.7 The Refinery Business Manager or delegate will route the approved permit package to the Head Operator to complete and post when the work is scheduled.
- 5.8 The Maintenance Supervisor (MS) is responsible for procuring the Fresh Air Permit.
- 5.9 The Safety Operator's duties include:
 - 1. Hang danger tape and permits.
 - 2. Monitor the progress of the job in the field and stop the work if an unsafe condition arises.
 - 3. Stay in communication with the plant control operator and communicate any change in process conditions which may impact the work.

- 5.10 The Head Operator will notify all personnel per permit requirements and participate in a Job Hazard Analysis (JHA) with the workers involved prior to posting the permit.
- 5.11 All notified relief system users must immediately alert the plant should conditions change that could impact the permitted work.
- 5.12 The Safety Operator and MS will conduct the in-field JHA.
- 5.13 All involved employees must follow the conditions of the permit and cease work if conditions change or safety of the job is compromised.

6.0 PROCEDURE

- 6.1 A Live Relief Work Permit is required prior to opening a system. A new permit is required for every disconnect or opening of the relief system and will be good for only one shift. For example, if a PSV will be removed and a replacement will be installed immediately, only one permit is required. If the PSV is removed and the system is sealed and then later reopened to install the replacement PSV, a second permit is required.
- 6.2 Maintenance will initiate the permit then route it through Operations for approval.
- 6.3 Chevron Fire Department is responsible for reviewing and approving an Emergency plan with affected workers, and delineating the hot zone.
- 6.4 Operations will obtain historical relief header gas analysis. The results will also be reviewed as part of the HSE.
- 6.5 An HSE will be conducted using the Live Relief HSE form. The HSE form and all supporting documents will be forwarded with and attach all required documents to the permit package for approval.
- 6.6 After all approvals are received, Maintenance will prepare the work site.
- 6.7 Operations will minimize any process flows or vents to the relief system to the extent safely practical. A log of these changes should be made so that the system can be returned to normal as soon as possible after the live relief work is completed.
- 6.8 If required by the HSE, establish a nitrogen purge as a means to reduce hydrocarbon release.
- 6.9 Operations will communicate with other process units as necessary to inform them of the need to maintain stable operation.

- 6.10 All units notified must immediately alert the plant doing the work of any process upset or other condition which may result in a release to the relief system. This should be done by radio or “orange phone” to make notification as quickly as possible.
- 6.11 Operations will make a final check of the process and workplace, hang Danger tape, post permits, and identify and mitigate/suspend all hot zone ignition sources.
- 6.12 All Hot Work Permits, unassociated vehicle entry permits and confined space entry permits within the immediate area must be suspended for the time the relief system is open.
- 6.13 If a crane is required, it should be placed upwind and wind direction monitored. The crane is a potential ignition source and may not be safe to use in this situation.

[Click here](#) to view an electronic version of the Live Relief Work Permit

LIVE RELIEF WORK PERMIT	
PERMIT NO. _____	
PERMIT STEPS MUST BE COMPLETED IN NUMERICAL ORDER—DO THE WORK SAFELY OR NOT AT ALL	
1.	Division _____ Unit/Area _____ Job Location _____ Date _____ Start Time _____ (AM/PM) Work must continue uninterrupted until completion. Work Order (or EWO) # _____ Description of Work _____ _____
2.	Job reviewed, initial alternatives explored; Emergency Plan developed and forwarded to CFD for review. Okay to proceed with HSE. Operations Supervisor _____ Maintenance Supervisor _____
3.	HSE conducted using Live Relief HSE form. Include documentation of alternatives explored and why alternatives were rejected. (HSE Attached) CFD Approval of Emergency Plan _____ Operations Supervisor Approval _____
4.	Special PPE or other precautions required per HSE: _____ _____
5.	RBUM Approval to Proceed _____
6.	Maintenance Manager Approval _____
7.	Operations Manager Approval _____
8.	Fresh Air Permit Completed Maintenance Supervisor _____
9.	Relief System Process Connections and Flows identified and attached to the permit. Non-essential flows isolated, flare KO pots drained, and any other requirements from the HSE completed. H/O _____

MS FrontPageReference/ref_inst/RI-New/ri-9900/9900forms/app12-livereliefpermit.doc

Page 1 of 2

10. Notifications Made by H/O
- a. RSC _____
 - b. CFD _____
 - c. HES/FSC _____
 - d. RBUM and Ops Supr. _____
 - e. All Plants Using Relief System. All Control Board Operators aware.

11. Danger Tape hung around Hot Zone
Safety Operator _____
12. Hot Zone Ignition sources identified and mitigated/suspended (Hot Work, vehicles, power tools, Hot Lines, spark-generating tools, etc.)
Safety Operator/HO _____
13. Hot Zone and Confined Space Permits suspended
Safety Operator/HO _____
14. Field Safety Meeting/JHA conducted with all involved workers. Include
Safety Operator _____
Maintenance Supervisor _____
15. JHA completed, conditions understood, equipment is ready and safe for release; and work is ready to begin.
Safety Operator _____
H/O _____
Fire Watch _____
Mechanics
a. _____
b. _____
c. _____
16. After work is complete, route document package to FSC for review and filing.
FSC _____

[Click here](#) to view the Health & Safety Evaluation Live Relief Work form

HEALTH & SAFETY EVALUATION LIVE RELIEF WORK	
HSE FORM	
RBU _____	Date _____ Work Order Number _____
Job Description _____	
HSE Participants (include people who will do the work if possible). _____ _____	
Justification. State why live relief work is required. _____ _____	
List Alternatives Considered and note why they were rejected. _____ _____ _____ _____	
Live Relief Flow Chart Reviewed Yes <input type="checkbox"/> No <input type="checkbox"/>	
Safety Precautions Reviewed: Expected worst case flare gas content reviewed. H ₂ S Content _____ PPM/Percent Possible Ignition Sources (vehicles, crane, electrical circuits, open flames, spark producing tools, etc.) _____ _____	
Consider impact of / on nearby activities (ignition sources, confined space entry, other maintenance work, wind direction, etc.). _____ _____ _____	
MS FrontPage/reference/ref_inst/RI-New/rs-9900/9900/forms/app12-HSE-form.doc	
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Safety Operator identified	Name	
Is a Fire Watch required?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is N ₂ purge recommended?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Special Live Relief Blind to be used?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Egress/Evacuation Plan reviewed**	Yes <input type="checkbox"/> No <input type="checkbox"/>	(reviewed by CFD)
Fire Prevention Plan reviewed**	Yes <input type="checkbox"/> No <input type="checkbox"/>	(reviewed by CFD)

List any unique safety concerns associated with this Live Relief Work job, include any special PPE:

1. _____

2. _____

3. _____

List mitigation measures to be taken to address above concerns:

1. _____

2. _____

3. _____

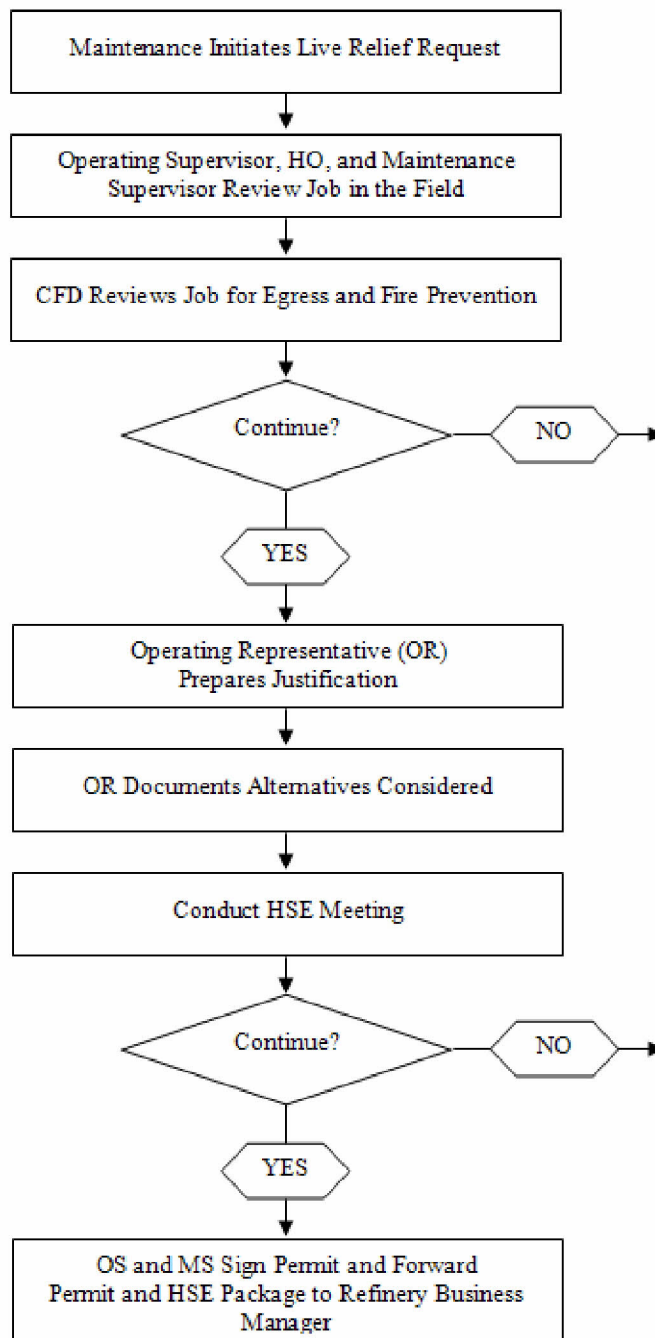
Can this job be done safely? Yes ☐ No ☐ If "no," do not proceed

(** components of Emergency Plan)

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FLOWCHART



FLOWCHART

